



THE  
JOURNAL  
OF THE  
ROYAL GEOGRAPHICAL SOCIETY.

VOLUME THE TWENTY-SIXTH.

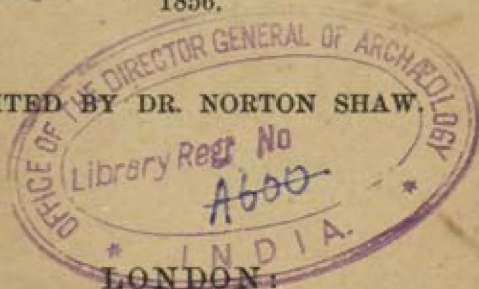
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EDITED BY DR. NORTON SHAW.



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# Royal Geographical Society.

1856.

## REPORT OF THE COUNCIL,

READ AT THE ANNIVERSARY MEETING ON THE 26TH MAY.

THE Council have the pleasure to submit to the Members of the Royal Geographical Society the following Report of its operations and financial progress during the past year:—

*Members.*—*Ordinary, Honorary and Corresponding.*—Since the last Anniversary 84 ordinary members have been added to the lists of the Society. Two corresponding members have also, upon the recommendation of the Council, been duly elected,—Lieut. Maury, of the United States Navy, and Captain Irminger, of the Danish Navy.

The Society has lost by death during the same period several valuable Associates, including the Vicomte de Santarem and Don José Urcullu, corresponding members.

The Society now consists of 57 honorary and corresponding members, and 840 ordinary members.

*Finances.*—The audited accounts of the past year, annexed to this Report, afford satisfactory evidence of the sound financial condition of the Society. The expenditure has in every respect been kept within the estimates submitted at the last General Meeting; whilst the receipts under the several heads of income have considerably exceeded the sums then calculated upon. Under these favourable circumstances the Council have applied a portion of the cash balance exhibited, arising from the compositions of life members, to the increase of the Society's permanent fund by the purchase of 600*l.* New 3 per Cents.

*Publications.*—The 25th volume of the Journal, edited by Dr. Shaw, is now ready for delivery. It comprises records of important geographical researches, illustrated by original maps, and contains much other matter of general interest.

A Summary of "the Proceedings of the Society, with additional Notices ordered for publication by the Council," has also been readily undertaken by our Secretary, with the assistance of Mr. F. Galton and the Revs. S. Clark and C. G. Nicolay, to whom the thanks of the Society are especially due. Three numbers have already appeared. It is considered that a periodical of this character, as a means of quickly disseminating geographical information, will prove valuable, not only to the Fellows of the Society, but to the public at large, by whom it may be obtained from the publisher, at a very low rate of subscription.

The Board of Trade has been added to the list of establishments to which the publications of the Society are presented.

*Map-rooms.*—The apartments now allotted to the Society's Maps and Charts have been visited for purposes of scientific reference during the past year by a large number of persons of different classes and pursuits; and the public importance of the Society's collection has on many recent occasions been fully evinced.

The general contributions to this department since the last Anniversary comprise 4 Atlases and upwards of 350 Maps and Charts; of which may be here specified a beautiful Physical Map of Madeira, dedicated to the Society by its active corresponding member, Mr. Ziegler; Views of Brazilian Vegetation by our honorary member, Dr. Martius; the new parts of Keith Johnston's Physical Atlas; also of Dr. Blackie's and of Fullarton's Atlases; seventeen additional sheets of the large 'Atlas de España y sus posesiones ultramar,' by our Associate, Colonel Coello, with Notes by another of our Associates, Don Pascual Madoz; a large Map of the Province of Oviedo, made by order of the Spanish Government; new sheets of the Map of the Sardinian States; the large Amt (or County) Maps of Norway, and others presented by the Royal University of Christiania; Vicomte de Santarem's facsimile of Fra Mauro's Map of the World; the new Geological Map of Europe, by Sir Roderick Murchison and Professor Nicol; M. Lesseps' Map of the Isthmus of Suez; Vestiges of Assyria, drawn by Commander Jones, R.N., from his surveys by order of the Government of India; the County of Sutherland, by the Surveyors of the Duke; Mr. Hall's new Map of the Eastern Frontier of the Cape of Good Hope; several original Manuscript Maps, including those by Dr. Livingston, Mr. Moffat, Mr. Erhardt, Colonel Codazzi, Dr. Kane, Mr. Porter, Mr.



Wallace; and the Surveys of the Atrato, presented by Mr. Kelley of New York.

*Library.*—The Library continues to be much frequented. The additions to the books of the Society, exclusive of Mr. Greenough's bequest, consist of 663 volumes and pamphlets. Among the most interesting of these acquisitions may be mentioned Burton's Pilgrimage to Mecca and Medina; Belcher's Last of the Arctic Voyages; Porter's Damascus; Andersson's Discoveries and Adventures in South Africa; Meadows' work on the Chinese and their Rebellions; Fullarton's and Boyce's Cyclopædias of Geography; Account of the United States Naval Astronomical Expedition under Lieut. Gilliss; and Reports of several Expeditions sent by the United States Government to explore the Rocky Mountains; of Professor Bache's United States Coast Survey, with numerous Charts; Documents relative to the Colonial History of the State of New York; Squier's new work on Central America; the 'Boletim e Annaes do Conselho Ultramarino,' by the Portuguese Government; the Transactions of the Smithsonian Institution of Washington; of the Franklin Institute of Pennsylvania; of the Canadian Institute, Toronto; of the Imperial Geological Institute of Vienna; of the Lombardo-Veneto Institute of Milan; of the Batavian Society of Arts and Sciences; of the Academies of Berlin, Christiania, Copenhagen, Madrid, Munich, Paris, Stockholm, and Vienna, &c.

*Greenough Bequest.*—In addition to the numerous contributions to the Library and Map-rooms, above noticed, these departments have been enriched by the acquisition of the Collection of Maps, Charts, and Books, bequeathed by Mr. Greenough. The Council, desirous to perpetuate the memory of the services rendered to the Society by this eminent geographer, have directed that a marble bust of him shall be executed and placed suitably in its apartments. They confidently look for the concurrence of the Members in this tribute of respect and gratitude.

Mr. Barrow of the Admiralty has recently added to the portraits previously presented by him that of Sir Robert M'Clure, our distinguished medallist. Such contributions illustrate very appropriately the objects and pursuits of the Society.

*Committee on Education.*—The Council have also to notice that,



in accordance with a second communication from the Lords of the Committee of Privy Council on Education, Dr. Shaw has been requested to act, in conjunction with the Rev. Mr. Temple and Mr. Sandford, the Government Inspectors, as Examiner in Geography, and that their Lordships have been again pleased to express their thanks for his services at the April Examination of the present year.

*Royal Premium* for "the Encouragement of Geographical Science and Discovery."—The Founder's Gold Medal has been awarded to Elisha Kent Kane, M.D., of the United States of America, for his services and discoveries in the Polar Regions during the American Expeditions in search of Sir John Franklin and his companions, and for his Memoir and Charts, communicated through the Admiralty; and the Patron's Gold Medal has been awarded to Heinrich Barth, Phil. Dr., of Hamburgh, for his successful and extensive explorations in Central Africa; his numerous excursions about Lake Chád; his discovery of the great river Benué; and his perilous journey to and from Timbuctú.

In connexion with this expedition the Council have awarded a Watch to Corporal Church, of the Royal Sappers and Miners, for his meritorious and intelligent services, as confirmed by his leader, Dr. Vogel.

*Bellet Testimonial.*—The Testimonial to the memory of the brave Lieutenant Bellet, which originated in the Royal Geographical Society, has been carried out by the erection of an obelisk of granite on the quay of Greenwich Hospital; and the Council learn with satisfaction from Sir R. Murchison, the Chairman, that the surplus of the fund, amounting to 1600*l.*, has been distributed among the five sisters of the deceased officer, of whom it is well recorded on his monument, that "in his endeavour to rescue Franklin he shared the fate and the glory of that illustrious navigator."

The Council cannot conclude this Report without a brief reference to the liberal co-operation at all times afforded by Her Majesty's Government in carrying out various important explorations. They would also advert to the valuable communications which have been received from all parts of the world, and which will be found recorded in the Journals and Proceedings of this Society.

# BALANCE-SHEET FOR THE YEAR 1855.

## Receipts.

## Expenditure.

	£.	s.	d.		£.	s.	d.
Subscriptions of 398 Fellows	..	..	796 0 0	House Rent and Fixtures	..	..	627 17 8
Compositions of 12 Fellows	..	..	300 0 0	Removal and Building Expenses	..	..	617 2 3
Entrance Fees of 71 Fellows	..	..	213 0 0	Salaries—Secretary, Curator, and Clerks	..	..	576 0 0
Government Grant	..	..	500 0 0	Journal and Illustrations	..	..	394 9 0
Greenough Bequest	..	..	500 0 0	Office Expenses	..	..	178 7 10
Journals and Indices sold	..	..	87 16 0	Wages and Collector's Poundage	..	..	72 0 0
Dividends on 2000 <i>l.</i> Stock	..	..	56 5 0	Books, Binding, and Diagrams	..	..	68 14 4
Royal Premium Grant	..	..	52 10 0	Greenough Bust	..	..	50 0 0
Arrears of Subscriptions	..	..	50 0 0	Royal Premium	..	..	49 12 0
Rent of Stables	..	..	23 15 0	Subscription overpaid and returned	..	..	2 0 0
Subscriptions overpaid	..	..	5 1 0				£ 2636 3 1
			£ 2684 7 0	Bankers' Balance, less Petty Cash overpaid	..	..	1102 10 3
Bankers' Balance less Petty Cash overpaid	..	..	1154 6 4				£ 3738 13 4
			£ 3738 13 4				

Examined and found correct.  
15, Whitehall Place, 7th March, 1856.

ROBERT BIDDULPH, *Treasurer*.

E. OSBORNE SMITH,  
THOS. H. BROOKING,  
H. RAPER,  
F. LE BRETON, } *Auditors*.







## Library Regulations.

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I. The Library will be open every day in the week (Sundays excepted) from *Eleven* in the morning to *Five* in the afternoon, except on New Year's Day, Good Friday to Easter Monday inclusive, and Christmas week; and it will be closed one month in the year, in order to be thoroughly cleaned, viz. from the first to the last day of September.

II. Every Member of the Society is entitled (subject to the Rules) to borrow as many as four volumes at one time.

### *Exceptions:*

1. Dictionaries, Encyclopaedias, and other works of reference and cost, Minute Books, Manuscripts, Atlases, Books and Illustrations in loose sheets, Drawings, Prints and unbound Numbers of Periodical Works, *unless with the special written sanction of the President.*
2. Maps or Charts, *unless by written order of the President, Council, or Secretaries.*
3. New Works before the expiration of a month after reception.

III. The title of every Book, Pamphlet, Map, or Work of any kind lent, shall first be entered in the register, with the borrower's signature, or accompanied by a separate note in his hand.

IV. No work of any kind can be retained longer than one month; but at the expiration of that period, or sooner, the same must be returned free of expense, and may then, upon *re-entry*, be again borrowed, provided that no application shall have been made in the mean time by any other Member.

V. In all cases a list of the Books, &c., or other property of the Society, in the possession of any member, shall be sent in to the Secretary *on or before the 1st of July in each year.*

VI. In every case of loss or damage to any volume, or other property of the Society, the borrower shall make good the same.

VII. No stranger can be admitted to the Library except by the introduction of a Member, whose name, together with that of the Visitor, shall be inserted in a book kept for that purpose.

VIII. Members transgressing any of the above Regulations will be reported by the Secretary to the Council, who will take such steps as the case may require.

By Order of the Council,

NORTON SHAW, Sec.

December 9, 1850.

# ROYAL GEOGRAPHICAL SOCIETY.

**Patron.**

THE QUEEN.

**Vice-Patron.**

H. R. H. PRINCE ALBERT.

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STRZELECKI, Count P. E. de, C.B., F.R.S.

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Bombay and Fellow of the Royal Soc. of Northern Antiquaries; Corresp.  
Memb. of the Imp. Geog. Soc. of St. Petersburg; Imp. Geol. Inst. of  
Vienna; Geog. Soc. of Darmstadt, &c.

**Bankers.**

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MACEDO, J. J. da Costa de . . . Lisbon	ZIEGLER, M. J. M. . . . . Wintethur

(26)



# FELLOWS.

\*N.B.—Those having \* preceding their names have compounded for life.  
Those having † have requested to be placed on the list as abroad.

Year of  
Election.

- |      |  |
|------|--|
| 1830 | Aberdeen, George, Earl of, K.G., K.T., M.A., F.R.S. <i>Argyll-house, Argyll-street; and Haddo-house, Aberdeen.</i>                     |
| 1855 | Acland, Prof. Henry Wentworth, M.D. <i>Oxford.</i>   |
| 1853 | Acland, Sir Peregrine Palmer F. P., Bart. <i>Fairfield, Somerset.</i>  |
| 1830 | *Acland, Sir Thomas Dyke, Bart., M.P., F.R.S. <i>Waterloo-hotel, Jermyn-street; and Killerton-park, Devon.</i>                         |
| 1830 | *Ainsworth, William Francis, Esq., F.S.A. <i>Ravenscourt-villa, New-road, Hammersmith.</i>   |
| 1830 | *Albemarle, George Thomas, Earl of. <i>Brooks' Club, St. James'; Quisdenham-hall, Larkingford, Norfolk; and Elcedon-hall, Suffolk.</i> |
| 1834 | *Alcock, Thomas, Esq., M.P. 95, <i>Park-street; and Kingswood-warren, near Epsom, Surrey.</i>  |
| 1839 | *Aldam, William, Esq.  |
| 1830 | Alexander, Lieut.-Col. Sir Jas. Ed., K.L.S., F.R.S.S., etc., 14th Regt. <i>United Service Club.</i>                                    |
| 1855 | 10 Alger, John, Esq. <i>Oriental Club, Hanover-square.</i>   |
| 1835 | *Allen, Capt. Wm., R.N., F.R.S. <i>Athenaeum Club; and 5, Oxford-row, Bath.</i>  |
| 1854 | Ancona, J. S., Esq. 26, <i>Gloucester-terrace, Hyde-park; and 8, John-st., Adelphi.</i>  |
| 1850 | *Andrew, William P., Esq. 26, <i>Montagu-square.</i>   |
| 1853 | Anstel, Prof. D. T., M.A., F.R.S., etc. 17, <i>Manchester-street, Manchester-square.</i>   |
| 1830 | *Antrobus, Sir Edmund, Bart. 146, <i>Piccadilly; Lower Cheam, Epsom, Surrey; and Amesbury, Wilts.</i>                                  |
| 1855 | *Arden, Richard Edward, Esq. <i>Sunbury-park, Middlesex.</i>   |
| 1837 | Armstrong, Alexander, Esq., M.D., R.N. 50, <i>Upper Bedford-place, Russell-square.</i>   |
| 1830 | *Arrowsmith, John, Esq., F.R.A.S. 10, <i>Soho-square.</i>  |
| 1853 | 10 *Ashwell, James, Esq., M.A., F.R.S. 17, <i>Manchester-street, Manchester-square.</i>  |
| 1856 | Ashwell, the Rev. Arthur Rawson, M.A., Principal of Oxf. Dioc. Training College. <i>The College, Cuddam, Oxon.</i>                     |
| 1851 | Astley, Francis D. P., Esq., M.R.I. <i>Fellfoot, Milnthorpe.</i>   |
| 1830 | Atkins, John Pelly, Esq., F.R.S. <i>Habstet-house, near Sevenoaks.</i>   |
| 1830 | *Attwood, Matthias Wolverley, Esq. 27, <i>Gracechurch-street.</i>  |
| 1832 | Auldjo, John, Esq., F.R.S. <i>Noel-house, Kensington; and Penighast, Argyllshire.</i>  |
| 1854 | Ayrton, Acton, Esq. 24, <i>Grafton-street, Bond-street.</i>  |
| 1845 | *Ayrton, Frederick, Esq. <i>Egypt.</i>   |
| 1836 | *Back, Sir Geo., D.C.L., F.R.S., Capt. R.N. 109, <i>Gloucester-place, Portman-square.</i>  |
| 1855 | Balkie, Wm. Balfour, Esq., M.D., R.N. <i>Brumrick-cottage, Forton-road, Gosport.</i>   |
| 1834 | *Baillie, David, Esq., F.R.S. 14, <i>Belgrave-square; and Hill-park, Surrey.</i>   |
| 1857 | 30 Baillie, Capt. John, 26th Bengal Native Infantry. 14, <i>St. James'-square.</i>   |
| 1830 | *Bally, Arthur, Esq., F.R.A.S. <i>Harefield, Southampton.</i>  |
| 1850 | Balnbridge, Joseph, Esq. 21, <i>Hyde-park-gardens.</i>   |
| 1830 | *Baker, Colonel G. 31, <i>Grosvenor-place, Bath.</i>   |

- Year of Election.
- 1855 Baker, Lieut. Wm. T., 25th Regt. 31, Grosvenor-place, Bath.
- 1853 Balfour, John C. B., Esq. *New South Wales; and Colinton, Moreton Bay.*
- 1847 Balfour, Lieut.-Colonel George, M.A. *East Indies.*
- 1852 Bancroft, Lieut. W. C., 16th Regt. *Aide de Camp and Military Sec., Jamaica.*
- 1840 \*Barclay, Arthur Kett, Esq., F.R.S. *Park-street, Borough; and Bury-hill, Dorking, Surrey.*
- 1852 Barclay, David, Esq. *Eastwick-park, Surrey.*
- 1849 40 Barclay, John, Esq. 7, Jeffreys-square, St. Mary Axe.
- 1838 Baring, Right Hon. Sir Francis Thornhill, Bart., M.P., F.R.S. *Stratton-park, Andover, Hants.*
- 1835 \*Baring, John, Esq.
- 1844 \*Baring, Thomas, Esq., M.P. 41, Upper Grosvenor-street.
- 1853 Barnett, Capt. Edward, R.N. 14, Woburn-square.
- 1854 †Barros, Don José Antonio. *Santamarta, New Granada.*
- 1833 Barrow, John, Esq., F.R.S., F.S.A. 7, New-street, Spring-gardens.
- 1856 Barth, Heinrich, Esq., PH. DR. 39, Alpha-road, St. John's-wood.
- 1835 \*Bateman, James, Esq., F.R.S., L.S. *Knyversley-hall, Staffordshire.*
- 1852 \*Bates, Joshua, Esq. 21, Arlington-street, Piccadilly; and East Sheen, Surrey.
- 1852 50 Bendmore, Nathaniel, Esq., C.E. 30, Great George-street, Westminster.
- 1830 Beaufort, Rear-Admiral Sir Francis, K.C.B., D.C.L., F.R.S., Corr. Inst. France. 11, Gloucester-place, Portman-square.
- 1854 Beaufort, William Morris, Esq., Bengal Civil Service. 11, Gloucester-place, Portman-square.
- 1856 Beaumont, John Augustus, Esq. *Mill Rose-hill, Putney-heath.*
- 1851 Beaumont, Wentworth B., Esq., M.P. 25, St. James's-place; Bywell-hall, Newcastle-upon-Tyne; and Bretton-park, Wakefield.
- 1830 \*Becher, Capt. Alex. B., R.N. *Admiralty; and 29, Upper Gloucester-place.*
- 1838 \*Beckford, Francis, Esq. *Traveller's Club.*
- 1854 Bedford, Commander Edward James, R.N. *Oban, N.B.*
- 1855 Bedingfield, Commander Norman B., R.N.
- 1845 Beke, Charles Tiltone, Esq., PH. DR., F.S.A., &c. *Mauritius.*
- 1830 60 \*Belcher, Capt. Sir Edward, C.B., F.R.A.S., R.N. *Union Club; and 6, Pelham-villas, Onslow-square, Brompton.*
- 1853 Belcher, Rev. Brymer.
- 1848 Beldam, Joseph, Esq. 3, Ploeden-buildings, Temple; and Royston, Cambridgeshire.
- 1850 \*Bell, James, Esq., M.P. 1, Devonshire-place, Portland-place.
- 1839 \*Bell, James Christian C., Esq. 42, Westbourne-terrace; and 15, Angel-court, Throgmorton-street.
- 1830 \*Bennett, John Joseph, Esq., F.R.S. *British Museum.*
- 1856 \*Benson, Robert, Esq. 16, Crown-hill Gardens, Bayswater.
- 1856 \*Benson, William, Esq., Barrister-at-Law. 8, Lincoln's-inn; and 6, Sussex-square, Hyde-park.
- 1830 Bentham, George, Esq., F.L.S. 91, Victoria-street, Westminster.
- 1856 Berry, Josiah, Esq. 16, Regent-square.
- 1842 70 \*Bethune, Rear-Admiral C. R. Driskwater, C.B.

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- 1839 Betts, John, Esq. 115, *Strand*.
- 1845 Biddulph, Robert, Esq. 43, *Charing-cross*; 31, *Eaton-place*; and *Ledbury, Herefordshire*.
- 1849 Bigsby, John J., Esq., M.D. 89, *Gloucester-place, Portman-square*.
- 1847 \*Bird, James, Esq., M.D. 27, *Hyde-park-square*.
- 1851 Bird, W. Wilberforce, Esq. 22, *Sussex-square, Hyde-park*.
- 1839 \*Blauw, William H., Esq., M.A., F.S.A., F.R.S. 3, *Queen Anne-street*; and *Beechlands, near Uckfield, Sussex*.
- 1849 Blackie, W. Graham, Esq., M.L.D. 36, *Frederick-street, Glasgow*.
- 1851 Blackwell, Thomas Evans, Esq., C.E. 10, *Corn-street, Bristol*.
- 1854 Blaine, D. Robertson, Esq., Barrister-at-Law. 3, *Paper-buildings, Temple*; and 24, *Beaufoy-terrace, Maida-vale*.
- 1857 80 Blakistoun, Lieut. Thomas, R.A. *Woodrick*.
- 1830 \*Blanshard, Henry, Esq., F.R.S. 53, *Chancery-lane*.
- 1834 Blacowe, Robert, Esq. *The Hook, Leices*.
- 1839 \*Blewitt, Octavian, Esq. 73, *Great Russell-street*.
- 1843 \*Bliss, Rev. Frederick. *Inverne Courtney, Blandford*.
- 1852 Block, Samuel Richard, Esq. *Green-hill, near Whetstone, Herts*.
- 1837 \*Blunt, Joseph, Esq.
- 1851 Bois, Henry, Esq. 110, *Fenchurch-street*.
- 1850 Bollert, William, Esq., Corr. Mem. University of Chile. 17, *Gracechurch-street*; and 14, *Brunswick-square*.
- 1834 \*Borradaile, Abraham, Esq. 34, *Fenchurch-street*.
- 1839 90 Borradaile, William, Esq. 20, *King's Arms-yard*.
- 1844 \*Borrer, Dawson, Esq. *Barrow-hill, Henfield, Sussex*.
- 1856 Botcherby, Blackett, Esq., M.A. 46, *Brompton-row*.
- 1839 \*Botfield, Beriah, Esq., F.R.S., F.S.A., F.R.S.N.A. 10, *Sackville-street, Piccadilly*; and *Norton-hall, Northamptonshire*.
- 1853 Bourne, Henry, Esq. *Ashted-house, Birmingham*.
- 1855 Bovet, Charles, Esq. 2, *Cornwall-crescent, Camden Town*.
- 1854 \*Bowen, Sir George Ferguson, K.C.M.G., M.A. *Late Fellow of Brasenose College, Oxford*; and *Permanent Secretary to the Lord High Commissioner of the Ionian Islands*.
- 1839 Bower, George, Esq. 6, *Takenhouse-yard, City*.
- 1853 Bowles, Vice-Admiral William, C.B. 8, *Hill-street, Berkeley-square*.
- 1856 Bowman, John, Esq. 9, *King William-street, City*.
- 1854 100† Bowring, Sir John, M.D., F.R.S.N.A. *Governor and Commander-in-chief, Hong Kong*.
- 1844 \*Boyd, Edward Lennox, Esq., F.S.A. 8, *Waterloo-place, Pall-mall*.
- 1856 Boyne, G. F. J. J. Hamilton-Russell, Viscount. 22, *Belgrave-square, &c.*
- 1851 Bracebridge, Charles Rolt, Esq. *Atherstone, Warwick*.
- 1854 Brand, George, Esq., M.A., F.S.A. 1, *James-st. Adelphi*; and *Stonehaven, N.B.*
- 1852 \*Broadbalt, John, Marquis of, K.T., F.R.S. 21, *Park-lane*; and *Taymouth-castle, Aberfeldie*.
- 1845 \*Brunt, George Smith, Esq. 13, *Caroline-street, Bedford-square*.
- 1846 Brereton, Rev. C. D., M.A. *Little Massingham, Roughton, Norfolk*.



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- 1833 \*Brereton, Rev. John, LL.D., F.R.S. *Bedford.*
- 1834 110 \*Breton, William Henry, Esq., Lieut. R.N., M.R.I. *Junior United Service Club; and 15, Camden-place, Bath.*
- 1856 Brewer, Rev. John S., M.A., Professor of English Literature. *King's College; and Well Walk, Hampstead.*
- 1852 \*Brierly, Oswald Walters, Esq. 8, *Lidlington-place, Harrington-square, Hampstead-road.*
- 1856 Brine, Lieut. Lindsay, R.N. *Claremont, Sidmouth.*
- 1854 Brine, Capt. Frederick, R.E. *Claremont, Sidmouth.*
- 1833 \*Brishau, Gen. Sir Thomas M., Bart., G.C.B., G.C.H., D.C.L., F.R.S., &c. *Makerston, Kelso, Scotland.*
- 1833 \*Brodie, Sir Benjamin Collins, Bart., D.C.L., V.F.R.S., &c., Serjeant Surgeon to the Queen. 14, *Smile-row; and Broome-park, Surrey.*
- 1848 Broke, Sir George N., Bart., Captain R.N. *Broke-hall, Suffolk.*
- 1856 Brook, Captain William, 30th Regt. *Gibraltar.*
- 1830 \*Brooks, Sir Arthur de Capell, Bart., M.A., F.R.S. *Athenæum Club; and Oakley, near Kettering, Northamptonshire.*
- 1838 120 Brooke, Sir James, K.C.B., D.C.L. *Rajah of Sarawak, Borneo.*
- 1856 \*Brooking, George Thomas, Esq. 10, *Connaught-square.*
- 1856 \*Brooking, Marmaduke Hart, Esq. 85, *Gloucester-place, Portman-square.*
- 1843 \*Brooking, Thomas Holdsworth, Esq. 14, *New Broad-street, City; and 85, Gloucester-place, Portman-square.*
- 1830 Broughton, John, Lord, G.C.B., M.A., F.R.S. 42, *Berkeley-square; and Erlestoke-park, Wilts.*
- 1856 Brown, Daniel, Esq. *The Elms, Larkhall-rise, Clapham.*
- 1837 Brown, John, Esq., F.R.S.N.A. 3, *Newcastle-place, Clerkenwell; and 2, Bloomfield Villas, Tufnel-park West.*
- 1830 \*Brown, Robert, Esq., Hon. D.C.L., F.R.S., Memb. Inst. Fr., St. Pet., Berlin, V.P. Linn. Soc., &c. 17, *Dean-street, Soho.*
- 1856 \*Brown, Samuel, Esq. 11, *Lombard-st.; and The Elms, Larkhall-rise, Clapham.*
- 1852 Browning, Henry, Esq., M.R.I. 72, *Grosvenor-street; and Ampton-hall, Bury St. Edmund's.*
- 1856 130 \*Browning, Thomas, Esq. 6, *Whitehall.*
- 1852 \*Brunel, Isambard Kingdom, Esq., F.R.S., &c. 18, *Duke-street, Westminster.*
- 1856 Bryant, Walter, Esq., F.R.C.S. 7, *Bathurst-street, Hyde-park-gardens.*
- 1844 Bryden, William, Esq. 4, *New Palace-yard, Westminster.*
- 1842 \*Buchan, John H., Esq. *Mexico.*
- 1830 Bullock, Capt. Frederick, R.N. *Woolrich.*
- 1839 Banbury, E. H., Esq., M.A. 15, *Jermyn-street.*
- 1850 Bansen, The Chevalier. *Heidelberg.*
- 1837 \*Burlington, William, Earl of, LL.D., M.A., F.R.S. 10, *Belgrave-square; and Hardwick-hall, Derbyshire.*
- 1830 \*Burney, Ven. Archd. Charles Parr, D.D., F.R.S., F.R.A. *Rectory-house, Bishop's Wickham, Essex.*
- 1830 140 \*Burton, Alfred, Esq. 36, *Marino, St. Leonard's.*
- 1833 \*Burton, Decimus, Esq., F.R.S., R.I. 6, *Spring-gardens; and St. Leonard's-cottage, Hastings.*

Year of Election.

- 1853 \*Buxton, Sir Edward North, Bart. 10, *Upper Grosvenor-street*; and *Coblenz-house, Cromer, Norfolk*.
- 1851 Bynoe, Benjamin, Esq., Surgeon R.N. *H.M.S. 'Madagascar,' Rio de Janeiro*.
- 1854 Byron, the Hon. Frederic. *Langford, Maldon, Essex*.
- 1830 \*Cabbell, B. B., Esq., M.P., M.A., F.R.S., F.S.A. 1, *Brick-court, Temple*; 52, *Portland-place*; and *Aldwick, Sussex*.
- 1855 \*Calthorpe, the Hon. F. H. Gough. 33, *Grosvenor-square*.
- 1854 Calvert, Frederic, Esq., Q.C. 9, *St. James's-place*; and 8, *New-square, Lincoln's-inn*.
- 1854 Calvert, John, Esq. 189, *Strand*; and *Kensington-park, Notting-hill*.
- 1830 \*Camden, George Charles, Marquis, K.B., D.C.L., M.A. 13, *Connaught-place, Hyde-park*; *Wilderness-park, Sevenoaks, Kent*; and *Bayham-abbey, Sussex*.
- 1844 150 \*Campbell, James, Esq.
- 1834 \*Campbell, James, Esq., jun., M.B.I. *Hampton Court-green*.
- 1853 \*Cardwell, Right Hon. Edward, M.P. 74, *Eaton-square*.
- 1830 \*Cartwright, Samuel, Esq., F.R.S., F.S.A. 32, *Old Burlington-street*; and *Nisell's-house, Tonbridge*.
- 1844 \*Chadwick, Hugo Marasyn, Esq. *New Hall, near Sutton-Cobfield*.
- 1855 Chapman, John, Esq. 124, *Pall Mall*; and *Leadenhall-street*.
- 1834 \*Chapman, Capt. John James, R.A. *Athenaeum Club*; and *Adelaide-sq., Belford*.
- 1840 Charters, Major Samuel, R.A. *Athenaeum Club*; and 3, *Belford-street, James-square, Bath*.
- 1855 Cheshire, Edward, Esq. *Conservative Club, St. James's-street*.
- 1839 \*Chesney, Major-General Francis Rawdon, R.A., D.C.L., F.R.S. *Athenaeum Club*; and *Ballygarra, Kilkeel, Down, Ireland*.
- 1856 160 Childers, John Walbanke, Esq. *Cantley Hall, near Doncaster*.
- 1850 Christmas, Rev. H., M.A., D.C.L., F.R.S., F.S.A. 30, *Manor-street, Clapham*.
- 1854 Christy, Henry, Esq. *Woodbines, near Kingston, Surrey*.
- 1854 \*Church, John Wm., Esq., B.A. *United University Club*; and *Woodside, Hatfield*.
- 1830 \*Church, W. H., Esq.
- 1849 Churchill, Lord Alfred. 6, *Bury-street, St. James's*; and 12, *Upper Belgrave-street, Belgrave-square*.
- 1856 Churchill, Charles, Esq., Merchant. 4, *Upper Hamilton-terrace, St. John's Wood*.
- 1853 Clarendon, George William, Earl of, K.G., G.C.B. 1, *Grosvenor-crescent*; *The Grove, Watford, Herts*; and *Hindon, Wilts*.
- 1852 Clark, Daniel, Esq. 49, *Milner-square, Islington*.
- 1840 \*Clark, Sir James, Bart., M.D., F.R.S., Physician to the Queen. 22 b, *Drook-street*.
- 1851 170 Clark, Rev. Samuel, M.A. *Principal of the Training College, Battersea*.
- 1830 \*Clarke, Sir Chas. Mansfield, Bart., M.D., F.R.S. *Wigginton-lodge, Tunsworth, Staffordshire*.
- 1855 Clarke, Rev. W. B., M.A. *Sydney, New South Wales*.
- 1841 \*Clavering, Sir William Aloysius, Bart. *United University Club, Pall-Mall East*.
- 1830 \*Clerk, Rt. Hon. Sir George, Bart., D.C.L., F.R.S., &c. *Clifton*; and *Pennycuik-house, Edinburgh*.
- 1856 Clive, Rev. Archer. *Whitfield, Hereford*.
- 1854 Clowes, George, Esq. *Stamford-street, Blackfriars*; and 57, *Russell-square*.



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- 1854 Clowes, William, Esq. *Stamford-street, Blackfriars; and Garretts, Banstead, Surrey.*
- 1852 Cobbold, John Chevallier, Esq., M.P. *Athenæum Club; 23, Suffolk-street; and Ipswich, Suffolk.*
- 1841 \*Cocks, Reginald S. T., Esq. 43, *Charing-cross.*
- 1838 180 Colchester, Charles, Lord, Rear-Admiral, D.C.L. 34, *Berkeley-square; and Kidbrooke, Sussex.*
- 1853 Cole, John Griffith, Esq., M.A., M.R.I. 8, *Charles-street, Berkeley-square.*
- 1841 \*Colebrooke, Sir Thomas Edward, Bart., F.R.A.S. 18, *Park-lane.*
- 1834 Colebrooke, Major-General Sir Wm., M.D., C.B., K.H., F.R.A.S. *Gov. and Com.-in-Chief of Windward and Leeward Islands.*
- 1854 Coleman, Everard Home, Esq., F.R.A.S. *Registry and Record Office, Adelphi-place, London Bridge.*
- 1848 Coles, Charles, jun., Esq. 86, *Great Tower-street.*
- 1835 \*Collett, William Rickford, Esq.
- 1835 Collinson, Captain Richard, C.B., R.N. *Boldon, Gateshead, Northumberland.*
- 1845 Colquhoun, Patrick de, Esq., LL.D., M.A. 3, *Hare-court, Inner Temple.*
- 1830 \*Conybeare, the Very Rev. William Daniel, Dean of Llandaff, M.A., F.R.S. *Deanery, Llandaff.*
- 1843 190 \*Cook, James, Esq. 40, *Mincing-lane; and Brooklands, Blackheath Park.*
- 1856 Cooke, John George, Esq. 2, *Upper Grosvenor-street.*
- 1852 Cooke, Robert, Esq. 50, *Albemarle-street; and 38, Nottingham-pl., New Road.*
- 1830 Cooley, William Desborough, Esq. 33, *King-street, Holborn.*
- 1843 \*Cooper, Capt. D. S., 1st Royal Regt. *Army and Navy Club.*
- 1856 Cooper, Captain Edward, Grenadier Guards. 6, *Charles-street, Berkeley-square.*
- 1853 Coote, Charles Chidley, Esq. *Mount-Coote, Limerick, Ireland.*
- 1853 Copley, Sir Joseph William, Bart. *Sprotborough, Doncaster.*
- 1839 \*Corrance, Frederick, Esq. *Parkham-hall, Framlingham, Suffolk.*
- \* 1856 Costerton, John C., Esq. *Canton.*
- 1853 200 \*Cosway, William Halliday, Esq. 32 a, *Mount-street.*
- 1854 Cowley, Norman, Esq. 4, *Montagu-place, Montagu-square.*
- 1854 Cox, Dr. Travers. *Fulham.*
- 1853 \*Crescree, Captain Peter, R.N.
- 1853 Crauford, Captain Frederic A. B., R.N. *Army and Navy Club.*
- 1830 \*Crauford, Captain Henry W., R.N.
- 1857 Crawford, James, Esq. *Brusa, Turkey.*
- 1848 Crawford, Robert Wigram, Esq. 71, *Old Broad-street, City.*
- 1830 Crawford, John, Esq., F.R.S. *Athenæum Club; and 4, Eaton-place West.*
- 1854 \*Creswell, Commodore Gurney, R.N. *Lynn, Norfolk.*
- 1856 210 Croker, T. F. Dillon, Esq. 6, *Strand.*
- 1852 Crowdy, James, Esq. 17, *Sergeants'-inn; and 1, Randolph-rd., Maiden Hill West.*
- 1839 \*Cubitt, Sir William, F.R.S., C.B. 19, *Great George-street, Westminster; and Clapham-common, Surrey.*
- 1844 \*Cubitt, Alderman William, M.P. *Gray's-inn-road; and 21, Abchurch-lane, City.*
- 1855 Cumming, Alexander, Esq., M.D., Inspector-Gen. of Hospitals. *Army and Navy Club.*

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- 1857 Cumming, William F., Esq., M.D. *Athenæum Club; and Athl-orescent, Edinburgh.*
- \*1846 Cunard, Edward, Esq. *New York.*
- 1846 Cunard, Samuel, Esq. *Hocchin's Hotel, St. James's-street.*
- 1838 \*Cunningham, George Godfrey, Esq. *Windermere, Westmoreland.*
- 1853 Cunningham, John Wm., Esq., Sec. King's College. *Somerset-house; and Harrow.*
- 1852 220 Cunynghame, Major-General Arthur Aug. T. *United Service Club.*
- 1843 \*Cursetjee, Manockjee, Esq., F.R.S.N.A. *Villa-Byculla, Bombay.*
- 1836 \*Curtis, Timothy, Esq.
- 1854 Daniell, James Nugent, Esq. *Esher, Surrey.*
- 1851 \*Daniell, William Freeman, Esq., M.D., F.L.S. 17, *Charles-street, St. James's-sq.*
- 1838 \*Darwin, Charles, Esq., M.A., V.P.R.S. *Athenæum Club; and Down, near Bromley, Kent.*
- 1855 Davis, Rev. Nathaniel. *Tunis.*
- 1846 Davis, Sir John Francis, Bart., K.C.B., F.R.S., F.R.S.N.A. *Athenæum Club; and Hollywood, near Bristol, Gloucestershire.*
- 1840 \*Dawson, the Hon. Payan. *Beningborough-hall, Yorkshire.*
- 1830 \*Dawson, Lieut.-Col. R. K., R.E. *Copyhold Enclosure and Tithe Commission, 3, St. James's-square.*
- 1855 250 Day, Frederick S., Esq. *Nantwich Grammar School, Cheshire.*
- 1852 De Boaville, Chev. Alexander, K.L.H. 3, *Holland-terrace, Maidstone, Kent.*
- 1856 De Crespigny, Lieut. C. A. C., R.N. 8, *Connaught-place, Hyde-park.*
- 1856 De Gez, William Francis, Esq. 14, *Suffolk-street, Pall Mall.*
- 1835 \*De Grey, Thomas Philip, Earl, F.S.A., F.R.A.S. 4, *St. James's-square; Newby-hall, Boroughbridge; and West-park, Silsby, Beds.*
- 1854 De la Rue, William Frederick, Esq. 108, *Bankhill-row.*
- 1834 \*Denison, His Excellency Sir William Thomas, Lieut.-Col. R.E., F.R.S. *Governor-General of Australia.*
- 1836 Denman, Capt. the Hon. Joseph, R.N. 17, *Eaton-terrace; H.M. Yacht, Portsmouth.*
- 1833 \*Derby, Edward Geoffrey, Earl of, F.C., F.L.S. 23, *St. James's-square; and Knowsley-park, Prescott, Lancashire.*
- 1836 De Roos, Captain the Hon. J. F. Frederick, R.N., F.R.E. 122, *Piccadilly.*
- 1854 240 \*Devaux, Alexander, Esq. 2, *Avenue-road, Regent's-park.*
- 1852 Devoy, William, Esq., Barrister-at-Law. 5, *Waterloo-place; and Woodlands, Burnet, Herts.*
- 1844 Dickinson, Major-Gen. Thomas, Bom. Eng., F.R.A.S. *Lower Tulse-hill, Norwood.*
- 1830 \*Dickinson, Francis Henry, Esq., F.S.A. 8, *Upper Harley-street; and King-Weston-park, Somerset.*
- 1833 Dickinson, John, Esq., F.R.S., F.S.A. 38, *Upper Brook-street, and Abbott's-hill, Hemel-Hempstead.*
- 1852 Dickinson, John, Esq., jun. 12, *Clarence Chambers, Haymarket; and Abbott's-hill, Hemel-Hempstead.*
- 1854 \*Dickinson, Sebastian Stewart, Esq., Barrister-at-Law. *Brown's-hill, Stroud, Gloucestershire.*
- 1843 Dickson, Peter, Esq. 28, *Upper Brook-street.*



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- 1835 \*Dilke, Charles Wentworth, Esq. 76, *Sloane-street*.
- 1845 \*Dilke, Charles Wentworth, Esq., jun. 76, *Sloane-street*.
- 1850 150 Dillon, the Hon. Arthur. 17, *Charges-street*.
- 1840 \*Divett, Edward, Esq., M.P. 97, *Eaton-square*; and *Eystock, near Exmouth, Devon*.
- 1854 Dixon, Wm. Hepworth, Esq., F.S.A. *Essex Villa, Queen's-road, St. John's-wood*.
- 1841 \*Dodd, George, Esq., F.S.A. 9, *Grosvenor-place*.
- 1854 Dodson, John George, Esq. 6, *Seamore-place, Park-lane*.
- 1854 \*Dolland, George, Esq. *St. Paul's Churchyard*.
- 1854 Donville, William T., Esq., R.N., M.D. *Army and Navy Club*.
- 1836 Donaldson, Rev. J. W., D.D., F.R.S.A. *Athenæum Club*.
- 1853 Donaldson, Stuart, Esq. *Sydney, Australia*.
- 1854 Donkin, Henry, Esq. 6, *Paragon, Kent-road*.
- 1851 160 Dover, John William, Esq. 124, *Fenchurch-street*.
- 1850 Douglas, Sir George, Bart. *Springwood-park, Lushburghshire*.
- 1854 Dower, John, Esq. 6, *Cunning-place, Pentonville*.
- 1853 Doyle, Sir Francis Hastings C., Bart. 12, *Great Cumberland-place, Hyde-park*.
- 1845 \*Drach, Solomon Moses, Esq., F.R.A.S. 23, *Walpole-street, King's-road, Chelsea*.
- 1849 Draper, George, Esq. 3, *Cambridge-place, Regent's-park*.
- 1846 Drummond, Major-General John. *The Boyce, Dymock, Gloucestershire*.
- 1846 Drury, Commander Byron, R.N. *Harrow*.
- 1851 \*Du Cane, Major Francis, R.E.
- 1851 \*Ducie, Henry John, Earl of, F.R.S. *Spring-park, near Stroud, Gloucestershire*.
- 1850 170 \*Duckett, Sir George, Bart., M.A., F.R.S., &c. *Bishop's Stortford, Herts.*
- 1852 Dakinfield, Rev. Sir Henry R., Bart. 33, *Eaton-place*; and *Stinklake-house, Berks*.
- 1840 \*Dundas, Right Hon. Sir David, Q.C. 13, *King's-Bench-walk, Temple*; and *Ochertyre, co. Perth*.
- 1830 \*Dundas, Rear-Admiral the Hon. Sir Richard Saunders, K.C.B. *H.M.S. 'Duke of Wellington,' Mediterranean*.
- 1850 Dunlop, A. Graham, Esq. *Wyndham Club*; and 7, *St. Helen's Place*.
- 1837 \*Dunraven, Edwin Richard, Earl of, F.R.S. *Adare-moor, Limerick*; and *Dunraven-castle, Glamorganshire*.
- 1856 Duprat, Chevalier Alfredo. *H.M.F. Arbitrator, Cape Town, Cape of Good Hope*.
- 1852 D'Urban, Colonel W. J. *Deputy Quartermaster-General, Canada*.
- 1854 Eardley-Wilmot, Capt. A. P., R.N. *H.M.S. 'Sphinx,' Mediterranean*.
- 1856 Eardley-Wilmot, Lt.-Col. F., R.A. *Director of the Cannon Foundries, Woolwich*.
- 1844 180 \*Ebrington, Hugh, Viscount, M.P. 17, *Druton-street*; and *Castle-Hill, South Molton, Devon*.
- 1852 Edwards, Henry, Esq. 1, *Bishopsgate-street*.
- 1853 Egerton, Captain the Hon. Francis, R.N. *Bridgewater-house*.
- 1854 Elife, Henri Christopher, Esq. 6, *Brompton-grove*.
- 1845 Ellenborough, Edward, Earl of, G.C.B. 108, *Eaton-square*; and *Southam-house, near Cheltenham*.
- 1855 \*Ellesmere, George Granville Francis, Earl of, &c. &c., *Bridgewater-house, Cleveland-square*.

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- 1830 \*Elliott, Rev. Charles Boileau, M.A., F.R.S. 47, Portland-place; and Tattingstone, Suffolk.
- 1855 †Elliott, Christopher, Esq., M.D. Colombo, Ceylon.
- 1857 Ellis, John Utlay, Esq. 13, Craven Hill Gardens, Bayneater.
- 1830 \*Elphinstone, the Hon. Mount-Stuart, F.R.A.S., F.R.S.N.A. Athenæum Club; and Waterloo Hotel, Jermyn-street.
- 1830 290 †Enderby, Charles, Esq., F.R.S., F.L.S. 13, Great St. Helen's.
- 1856 Entwisle, John, Esq. 1, Russell-square.
- 1852 Erskine, Captain John Elphinstone, R.N. H.M.S. 'Orion;' and Cardross, Stirling, N. B.
- 1850 Espinasse, Capt. J. W., 12th Regt. Mauritius.
- 1851 Evans, Rev. Charles. Rugby.
- 1857 Evans, Frederic J., Esq. Admiralty; and 4, Wellington-terrace, Charlton, Blackheath.
- 1830 \*Evans, Capt. George, R.N. 5, New-street, Spring-gardens; and Englefield-green, Chertsey.
- 1830 \*Evans, W. Esq.
- 1851 \*Evelyn, William J., Esq., M.P., F.S.A. Ellis's Hotel, St. James's-street; and Wotton-house, near Dorking.
- 1845 \*Everest, Col. Geo., Bengal Art., F.R.S., &c. 10, Westbourne-street, Hyde-park.
- 1830 300 \*Everett, James, Esq.
- 1839 Ewer, Walter, Esq., F.R.S., F.L.S. 8, Portland-place.
- 1856 Ewing, J. D. Crum, Esq. 7, Cork-street, Burlington Gardens.
- 1856 †Eyre, Major Vincent. Athenæum Club; and India.
- 1857 Faddy, Lieutenant-Colonel F. P., R.A. Woolwich.
- 1855 Fagan, Lieut.-Col. C. G. 65, Cornhill, City.
- 1857 Fairholme, Lieutenant Charles, R.N. H.M.S. 'Megara.'
- 1856 Fairholme, George Knight, Esq. Union Club.
- 1838 Falconer, Thomas, Esq. Usk, Monmouthshire.
- 1855 \*Fanahawe, Capt. E. G., R.N. H.M.S. 'Centurion;' & 27, Rutland-gate, Hyde-park.
- 1854 310 Farmer, William Francis Garbul, Esq. Nonsuch-park, Surrey.
- 1853 \*Fayrer, John, Esq., M.D., Hon. E. India Company's Service. Lucknow.
- 1838 \*Fellows, Sir Charles. 4, Montagu-place, Russell-square; Cowes, Isle of Wight; and Beeston, Nottinghamshire.
- 1856 Ferguson, Rev. Robert, LL.D., F.S.A. St. Alban's Villa, Ryde, Isle of Wight.
- 1856 Ferguson, William, Esq. 31, Torrington-square.
- 1840 \*Ferguson, James, Esq., F.R.A.S. 20, Langham-place.
- 1830 Findlay, Alexander, Esq. 4, Quality-court, Chancery-lane; and Hayes, Kent.
- 1844 Findlay, Alex. George, Esq. 4, Quality-court, Chancery-lane.
- 1830 \*Fitton, Wm. Henry, Esq., M.D., F.R.S., F.L.S. Athenæum Club; and Sussex-gardens, Hyde-park.
- 1830 Fitz-Roy, Rear-Admiral Robert, F.R.S. Athenæum Club; and 38, Onslow-sq., Brompton.
- 1830 320 Fitzwilliam, Charles William, Earl, F.R.S., F.S.A. Mortimer-house, Halkin-st.; Milton, near Peterborough; and Wentworth-house, near Rotherham, Yorkshire.



Year of  
Election.

- 1853 \*Fleming, Rev. Francis, Sec. to Sec. for Promoting Gospel in Foreign Parts.  
79, Pall Mall.
- 1847 Forrester, Joseph J., Esq., F.R.S. 24, Crutched Friars, City; and Oporto.
- 1844 Forster, Rev. Charles, M.D. Stisted Rectory, Essex.
- 1839 \*Forster, William Edward, Esq.
- 1850 †Forsyth, Commander Charles Codrington, R.N. H.M.S. 'Hornet,' China Station.
- 1850 \*Fowler, Robert N., Esq., M.A. 50, Cornhill; and Tottenham.
- 1841 \*Fowler, Rear-Admiral Robert M. Wolliscote-house, Pangbourne.
- 1830 \*Fox, Lieut.-Gen. Charles R. Travellers' Club; and 1, Addison-road, Kensington.
- 1854 Fox, Sir Charles, C.B., F.R.S. 8, New-street, Spring-gardens; and Far-  
quhar-house, Hornsey-lane, Highgate.
- 1854 330 Fraser, Charles, Esq. 38, Conduit-street.
- 1830 Fraser, Major-General John, R.E. Deputy Quartermaster-General, Ceylon.
- 1856 Fremantle, Rt. Hon. Sir Thomas F., Bart. 4, Upper Eccleston-street, Belgrave-sq.
- 1852 French, Dr. James, C.B. Inspector-General of Hospitals, Graham's Hotel,  
Edinburgh.
- 1850 Frere, Bartle J. L., Esq. 45, Bedford-square.
- 1839 \*Frere, George, Esq., jun. Cape of Good Hope; and 45, Bedford-square.
- 1839 \*Frere, Rev. Temple. Cloisters, Westminster.
- 1842 Frere, William Edw., Esq., F.R.S. Bombay; and 45, Bedford-square.
- 1830 Freshfield, James William, Esq., M.P., F.R.S. 6, Devonshire-place, Portland-  
place; and Manor-place, Betchworth, Surrey.
- 1853 Frith, John Griffith, Esq. 13, Wimpole-street; and 11, Austin Friars, City.
- 1855 340 Fuller, J., Esq. Stevens' Hotel, Bond-street.
- 1853 \*Gabriel, Edmund, Esq. H.M.'s Arbitrator, St. Paul de Loudo; and  
1, James-street, Adelphi.
- 1845 \*Gage, Admiral Sir William Hall, G.C.B., K.C.B. Arthur's Club; and Thorston  
Cottage, Bury St. Edmund's, Suffolk.
- 1855 \*Galloway, John James, Esq. Survey Department, Sydney.
- 1848 \*Galton, Capt. Douglas, R.E. 12, Chester-street, Grosvenor-place.
- 1850 \*Galton, Francis, Esq. 55, Victoria-street, Westminster; and 5, Bertie-terrace,  
Leamington.
- 1854 \*Gammell, Andrew, Esq. Drumtochty, Kincardineshire, N.B.
- 1830 \*Garry, Nicholas, Esq., F.R.S. Esher, near Clarendon, Surrey.
- 1833 Gascoigne, Capt., Ceylon Rifles. Athenæum Club.
- 1838 \*Gawler, Colonel George, R.H. United Service Club; and 4, West Cottages,  
Cowes, Isle of Wight.
- 1830 350 \*Gibbes, Charles, Esq., M.B.L. 24, Cavendish-square.
- 1853 Gifford, George, Earl of. 2, Wilton-street, Grosvenor-place.
- 1855 Gillespie, Alexander, Esq. 3, Billiter-square, City; and 38, Gordon-square.
- 1852 Gisborne, Lionel, Esq., C.E. 6, Duke-street, Adelphi.
- 1836 Gladdish, William, Esq. Cliff-cottage, near Gravesend.
- 1845 \*Gladstone, William, Esq. 57½, Old Broad-street, City.
- 1854 Glen, Joseph, Esq., M.D., Mem. Geogr. Soc. of Bombay. Oriental Club.
- 1853 Goderich, George Frederick, Viscount, M.P. 1, Carlton-gardens.

Year of Election.	
1830	Goldsmidt, Sir Isaac Lyon, Bart., F.R.S., F.S.A. <i>Park Lodge, Regent's-park; and The Wick, Brighton.</i>
1836	Gordon, Alexander, Esq., C.E. 22, <i>Fludley-street, Whitehall.</i>
1836	350*Gordon, Colonel the Honourable Alexander Hamilton, C.B., Deputy Quarter-master-General. <i>Argyll-house.</i>
1834	Gordon, Harry George, Esq. 1, <i>Clifton-place, Hyde-park-gardens; and Killie-chassi, Dunkeld, Perthshire.</i>
1836	Gordon, James Wilkinson, Esq. Agent, <i>Theodore Martin, Esq., 10, New Palace Yard.</i>
1836	Gordon, Rear-Admiral the Honourable John. 13, <i>Queen Anne-street.</i>
1833	Gordon, Captain Robert, R.N. <i>United Service Club.</i>
1833	Gore, Montagu, Esq. 20, <i>South Audley-street.</i>
1833	Gore, Richard Thomas, Esq. 6, <i>Queen-square, Bath.</i>
1833	Gorman, John, Esq., M.D. <i>Mark-lane, City; and Port St. Mary, Spain.</i>
1835	Gould, Captain Francis A., R.E.
1846	Gould, John, Esq., F.R.S., F.L.S. 20, <i>Broad-street, Golden-square.</i>
1830	*Gowen, James Robert, Esq. Treasurer of the Horticultural Society. 1870, <i>Piccadilly.</i>
1834	370*Grace, Rear-Admiral Percy. 60, <i>Green-street, Grosvenor-square.</i>
1833	*Graham, the Right Hon. Sir James Robert George, Bart., M.P., F.R.S., &c. 45, <i>Grosvenor-place; and Netherby, near Carlisle.</i>
1830	*Gray, John Edw., Esq., M.D., F.R.S., V.P.Z.S. and L.S., FR. R.S. <i>British Museum.</i>
1830	Greene, Thomas, Esq., M.P. 19, <i>Duke-street, Westminster; Slys, Lamonster; and Whittington-hall, near Burton, Westmoreland.</i>
1833	Griffell, Riversdale W., Esq. 27, <i>Upper Thames-street.</i>
1830	*Grewell, Rev. Richard, M.A., F.R.S. <i>Worcester College, Oxford.</i>
1832	Greville, Algernon, Esq. <i>Travellers' Club.</i>
1837	*Grey, Sir George, K.C.B. Governor & Commander-in-Chief, <i>Cape of Good Hope.</i>
1844	*Grey, Ralph William, Esq., M.P. 47, <i>Belgrave-sq.; and Chipchase-castle, Hexham.</i>
1835	Griffith, George Reelard, Esq. 80, <i>Westbourne-terrace, Hyde-park.</i>
1839	380 Griffith, John, Esq. 16, <i>Finchbury-place, South.</i>
1836	Griffith, Richard Clewin, Esq. 10, <i>Gower-street.</i>
1835	Grindrod, R. B., Esq., M.D., LL.D., F.L.S., &c. <i>Townsend-house, Malvern.</i>
1837	Grumisen, Charles Lewis, Esq. 16, <i>Surrey-street, Strand.</i>
1830	*Gurney, Hudson, Esq., F.R.S., F.S.A., F.R.S.N.A. 9, <i>St. James's-square; and Kenick-hall, near Norwich.</i>
1841	*Haklinton, Thomas, Earl of, K.P., F.R.S. 43, <i>Berkeley-square; and Tynning-home-house, Prestonkirk, Haddingtonshire.</i>
1830	*Halford, the Rev. Thomas, M.A. 2, <i>Hammer-square; Laleham, Middlesex; and Outwell, Norfolk.</i>
1833	*Halkett, Rev. Dunbar S. <i>Little Bookham, Surrey.</i>
1833	*Halkett, Lieut. Peter A., R.N. <i>Wyndham Club.</i>
1833	Hall, Captain William Hutcheson, R.N., F.L.S. <i>United Service Club; H.M.S. 'Elsheim'; and Shipbourne Lodge, Tonbridge.</i>
1830	390 Hallam, Henry, Esq. Trust. Brit. Mus., M.A., F.R.S., V.P.S.A., F.R.S.N.A., M. Fr. Inst. 24, <i>Wilton-crescent; and Pickhurst, Hayes, Kent.</i>



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- 1856 Halloran, Alfred L., Master R.N. *Coast Guard, Polperro, near Liskeard.*
- 1850 \*Hamilton, Capt. Henry G., R.N. 71, *Eccleston-square.*
- 1850 Hamilton, Terrick, Esq. 121, *Park-street, Grosvenor-square.*
- 1846 Hamilton, Rear-Admiral William Alexander Baillie. *Mucortney House, Blackheath.*
- 1837 Hamilton, Wm. John, Esq., F.R.S. 23, *Chesham-place.*
- 1830 \*Hamilton, William Richard, Esq., Trust. Brit. Mus., F.R.S., F.S.A., V.P.R.S., &c. 12, *Bolton-row.*
- 1830 Hammerley, Charles, Esq. 25, *Park-crescent, Portland-place.*
- 1853 \*Hans, Captain George S., R.N. *United Service Club; and H.M.S. 'Sampson.'*
- 1857 Hankey, Thomson, Esq., M.P. 45, *Portland-place.*
- 1837 400 \*Hammer, Sir John, Bart., M.P., F.R.S. 59, *Eaton-place; and Hammer-hall and Bettisfield-park, Flintshire.*
- 1840 \*Harcourt, Egerton, Esq. *Athenæum Club; and 5, Cavillon-gardens.*
- 1853 Harcourt, Rear-Admiral Octavius Vernon. 29, *Deconshire-place, Portland-place; and Seinton-park, Bedale, Yorkshire.*
- 1834 \*Harding, Major-Gen. George Judd, C.B. *Lieut.-Governor of Guernsey.*
- 1854 Hardy, Peter, Esq., F.R.S. 36, *Brunswick-square.*
- 1851 Harrington, Edward J., Esq. 169, *New Bond-street.*
- 1830 \*Harrlott, Colonel T. G., R. Staff Corps. *Twickenham.*
- 1853 Harris, Captain the Hon. Edw. A. J., R.N. *H.B.M.'s Consul for Chile.*
- 1855 Harris, the Hon. and Rev. C. A. *Woodfield, Southampton.*
- 1852 Harris, George Frederick, Esq., M.A. *Harrow-park, Middlesex.*
- 1856 410 Harrison, George Marsh, Esq. 10, *Lansdowne-road Villas, Notting-hill.*
- 1847 Harrowby, Dudley, Earl of. 39, *Grosvenor-square; Sindon-house, Lichfield; and Norton, Gloucestershire.*
- 1854 \*Hartland, Frederick D., Esq., F.S.A., &c. *The Oaklands, near Cheltenham.*
- 1845 Harvey, W. S., Esq., R.N. *Onminney and Co., Charing-cross.*
- 1834 Hawkins, Bisset, Esq., M.D., F.R.S., F.S.S. 29, *Upper Harley-street; and West Court, Wokingham, Berks.*
- 1840 \*Hawkins, John, Esq.
- 1830 Hawtrey, Rev. Dr. Edward Craven, D.D., F.S.A. *Eton College.*
- 1852 \*Hay, Capt. J. C. Dalrymple, R.N. *H.M.S. 'Hannibal,' Mediterranean. 24, Prince's-gate, Hyde-park, South.*
- 1830 \*Hay, Robert Wm., Esq., F.R.S., F.S.A., &c. *Blechynden-terrace, Southampton.*
- 1853 Hayward, Robert Newton, Esq. *Porchester-villa, Orange-hill, Edinburgh.*
- 1856 420 Heath, J. Benjamin, Esq., F.R.S., F.S.A., Consul for Sardinia. 66, *Russell-square.*
- 1856 Henderson, Andrew, Esq. 21, *Cambridge-street, Hyde-park-square.*
- 1837 \*Henderson, James, Esq. *Littlewood-park, Forbes, Aberdeenshire.*
- 1853 †Henderson, John, Esq. *Valparaiso.*
- 1852 Henderson, William, Esq. 5, *Stanhope-street, Hyde-park-gardens.*
- 1844 \*Heneage, Edward, Esq. 14, *William-street, Loewes-square.*
- 1838 \*Henry, Wm. Chas., Esq., M.D., F.R.S. *Huffield, near Ledbury, Herefordshire.*
- 1834 \*Herbert, Jacob, Esq. *Trinity-house, Tower-hill.*
- 1845 Herbert, Right Hon. Sidney, M.P. 49, *Belgrave-square; and Wilton-house, Wilts.*

Year of  
Election.

- 1833 \*Herbert, Sir Thomas, M.P., K.C.B., Rear-Admiral. 74, Cadogan-place; and  
Ture Cottage, Killarney, Ireland.
- 1837 430 Herd, Captain D. J. 2, Norway-house, Limehouse.
- 1841 Hensley, James Augustus, Esq. Brightstone, Isle of Wight.
- 1836 Hewitt, James, Esq. Lecturer in Battersea Training College.
- 1840 \*Heywood, James, Esq., M.P., F.R.S., F.S.A. Athenaeum Club; 5, Eaton-place;  
and The Headlands, Prestwich, near Manchester.
- 1853 Hickey, Edwin, Esq. Sydney.
- 1856 Hill, Arthur Bowdler, Esq. Southfield, Clapham-park.
- 1854 Hill, Lieut.-Colonel Stephen J. Army and Navy Club; and Governor and  
Commander-in-Chief, Sierra Leone.
- 1845 \*Hindmarsh, Frederick, Esq. 17, Bucklersbury.
- 1846 Hobbs, J. S., Esq. 157, Leadenhall-street, City.
- 1855 \*Hobbs, Wm. Geo. Ed. Master of Grammar School, Waresale, near Ware.
- 1830 440 Hobhouse, Henry William, Esq. 28, South-street, Park-lane.
- 1834 \*Hodgkin, Thomas, Esq., M.D. 35, Bedford-square.
- 1856 Hogg, James, Esq., Jun. 18, St. Andrew's Square, Edinburgh.
- 1830 Hogg, John, Esq., M.A., F.R.S., F.L.S., Foreign Sec. R. Soc. of Literature.  
S. Sergeants' Inn, Temple; and Norton-house, Stockton-upon-Tees.
- 1839 \*Holford, R. S., Esq. Dorchester-house, Park-lane.
- 1830 Holland, Sir Henry, Bart., M.D., F.R.S. 25, Lower Brook-street.
- 1847 Holman, J. Baptiste, Esq. 4, Exchange-buildings, Cornhill.
- 1835 \*Holmes, James, Esq. 4, New Ormond-street, Queen-square.
- 1830 \*Holroyd, Arthur Todd, Esq., M.D., F.L.S. Athenaeum Club.
- 1830 \*Hooker, Sir Wm. Jackson, K.H., PH. D., LL.D., F.R.S., F.S.A., F.L.S., &c.  
West-park, Kew.
- 1840 450 \*Hope, Alex. James Beresford, Esq. 1, Connaught-place, Hyde-park; and  
Bedgebury-park, Hurst-green, Kent.
- 1853 Hoskins, George Alex., Esq. 10, Gloucester-square, Hyde-park.
- 1856 Hovell, William Hilton, Esq. Florence.
- 1853 Howard, Sir Ralph, Bart. 17, Belgrave-square; and Bushy-park, Wicklow.
- 1842 \*Hubbard, J. Gellibrand, Esq. 24, Prince's-gate, Hyde-park, South.
- 1838 Hughes, William, Esq. 13, Paternoster-row.
- 1838 \*Hume, Edmund Kent, Esq.
- 1857 Hunt, Zacharius Daniel, Esq. Aylesbury.
- 1851 Hyde, James Bartlet, Esq. Conservative Club; and Apley, Ryde, Isle of Wight.
- 1854 Inall, Benjamin, Esq. 2, Craven-hill-gardens, Bayswater.
- 1852 460 Illingworth, Richard Stonhewer, Esq. 9, Norfolk-crescent, Hyde-park.
- 1850 \*Imray, James, Esq., Jun. 102, Minorities; and Manor-park, Streatham.
- 1851 Inglesfield, Captain Edward A., R.N., F.R.S. 53, Cambridge-street, Hyde-park.
- 1846 Ingram, Hughes Francis, Esq. University Club; and Yotes-court, Mervicorth,  
Maidstone.
- 1852 Inskip, Rev. Robert Mills, 8, Boon's-place, Plymouth.
- 1840 \*Irby, Frederick, Esq. Athenaeum Club.
- 1852 Irving, Thomas, Esq. 9, Norland-place, Notting-hill.

Year of Election.	
1850	Jackson, William, Esq. 47, <i>Russell-square</i> .
1855	Jackson, William, Esq., M.P. 25, <i>Cambridge-square, Hyde-park</i> .
1854	Jellicoe, Charles, Esq. 5, <i>Wimpole-street</i> .
1854	470 Jenkins, Capt. Griffith, R.N. <i>India</i> .
1840	*Jenkins, R. Castle, Esq.
1853	Jenkyn, Rev. Thomas Williams, D.D. <i>Rochester</i> .
1851	Jennings, John, Esq., F.R.S. 20, <i>New Ormond-street, Queen-square</i> .
1854	*Jennings, William, Esq., M.A. 13, <i>Victoria-street, Westminster</i> .
1837	Jervis, Lieut.-Col. Thomas Best, E.I.C. Eng., F.R.S., F.L.S. <i>Athenæum Club</i> .
1854	Johnson, John Hugh, Esq. 35, <i>Constitution-street, Leith, Edinburgh</i> .
1842	Johnston, Alex. Keith, Esq., F.R.S.E., Hon. Mem. Berl. Geog. Soc., etc. <i>March-hall-park</i> ; and 4, <i>St. Andrew-square, Edinburgh</i> .
1856	Johnston, A. R., Esq. <i>Athenæum Club</i> ; and 25, <i>Manot-street</i> .
1853	Johnstone, Sir John Vanden Bempde, Bart., M.P., D.C.L. 27, <i>Grosvenor-square</i> ; and <i>Hackness-hall, near Scarborough</i> .
1851	480 Jones, Major-General Sir Harry David, R.E., F.R.S.
1833	*Jones, William H., Esq., F.R.S. 4, <i>Rupert-street</i> .
1840	*Kalergi, John, Esq., M.R.I. 23, <i>Montagu-square</i> .
1835	Kane, Major Fred. A. C., 15th Regt. Bombay M.L. <i>Junior United Service Club</i> .
1845	*Kellett, Commodore Henry, R.N., C.B. <i>Clonmell, Ireland</i> ; and <i>H.M.S. 'Ter-magant,' North America and West Indies</i> .
1854	Kennedy, Rev. John, M.A. 4, <i>Stepney-green</i> .
1851	†Kent, John, Esq. <i>Shafston, Moreton Bay, Australia</i> .
1845	King, Lieut.-Colonel Edward R., 36th Regt. <i>Zante</i> .
1830	Knight, Charles, Esq. 90, <i>Fleet-street</i> ; and 8, <i>Carlton-villas, Manilla-calle</i> .
1849	*Laffan, Capt. Robert Michael, R.E., M.P. <i>Army and Navy Club</i> ; and <i>Otham lodge, Kent</i> .
1833	490*LaIRD, M'Gregor, Esq. 3, <i>Mincing-lane</i> ; and 2, <i>Clarendon-terrace, Brighton</i> .
1838	*Lance, John Henry, Esq., F.L.S. <i>The Holmwood, Dorking</i> .
1856	Langler, J. R., Esq., Lecturer in Wesleyan Normal Institution. <i>Westminster</i> .
1856	Lansdowne, Henry Marquis of, K.G., D.C.L., F.R.S. <i>Lansdowne-house, Berkeley-square</i> ; <i>Bowood-park, Wilts</i> ; and <i>Richmond-hill, Surrey</i> .
1833	*Larcom, Lieut.-Colonel Thomas Aiskew, R.N., F.R.S. <i>Custom-house, Dublin</i> .
1855	Laroche, William Thomas, Esq. <i>Reform Club</i> ; and <i>Wanstead</i> .
1852	Latham, Robert Gordon, Esq., M.D., F.R.S., &c. <i>Greenford-house, Harewell, Middlesex</i> .
1854	Latrobe, Charles Joseph, Esq. <i>Athenæum Club</i> ; and <i>the Mote, Tunbridge</i> .
1854	Laurie, Walter, Esq. 2, <i>Princes-street, Mansion-house</i> .
1846	*Law, the Hon. Henry Spencer, M.A. 1, <i>Lowndes-street</i> ; and <i>Ellington-house, Ramsgate</i> .
1830	500 Law, William J., Esq. 63, <i>Upper Seymour-street</i> ; 33, <i>Lincoln's-inn-fields</i> ; and 5, <i>Sussex-square, Brighton</i> .
1850	Lawrence, Edward D., Esq. 20, <i>King-street, Portman-square</i> .
1830	*Lenke, Colonel William M., LL.D., F.R.S. 50, <i>Queen-Anne-street</i> .



Year of  
Election.

- 1853 \*Le Breton, Francis, Esq. 21, *St. James's-place, Regent's-park.*
- 1856 Lee, Charles, Esq. 41, *Grosvenor-place.*
- 1830 \*Lee, John, Esq., LL.D., F.R.S., F.S.A., F.R.S.N.A., &c. 5, *College, Doctors'-commons; and Hortwell-house, near Aylesbury, Bucks.*
- 1839 Lee, Thomas, Esq., M.R.I. 5, *George-yard, Lombard-street; and Great Barr, Staffordshire.*
- 1833 \*Lefevre, John George Shaw, Esq., M.A., F.R.S., Vice-Chancellor of the University of London. 6, *Old Palace-yard.*
- 1853 Lefroy, Lt.-Colonel John Henry, R.A., F.R.S. *Pall Mall; and 54, Cambridge-terrace, Hyde-park.*
- 1845 Leigh, John Studly, Esq. 15, *Westbourne-park-crescent.*
- 1836 510 Lemon, Sir Charles, Bart., M.P., F.R.S., F.D.S., &c. 46, *Charles-street, Berkeley-square; and Carclew, near Falmouth, Cornwall.*
- 1855 Leslie, G. F. Esq. 45, *Rotham-gate, Hyde-park.*
- 1840 \*Letts, Thomas, Esq. 8, *Royal Exchange.*
- 1853 Lervaque, Peter, Esq., F.S.A. 29, *Guildford-street, Russell-square.*
- 1830 Levien, Edward, Esq. 121, *Gloucester-terrace.*
- 1851 Leycester, Commander Edmund M., R.N. *H.M.S. 'Madagascar,' Rio Janeiro.*
- 1855 \*Lindsay, Wm. S., Esq., M.P. 17, *Portland-place.*
- 1852 Locke, Joseph, Esq., M.P., F.R.S. 23, *Lowndes-sq.; and 13, Duke-st., Westminster.*
- 1856 \*Logan, Sir William Edmond, F.R.S. *Montreal, Canada.*
- 1855 Login, Sir John S., Surgeon E. I. C. Service. *Rockhampton.*
- 1850 520 Londesborough, Albert Lord, F.R.S., F.S.A. 8, *Carlton-house-terrace; and Grimston, Tadcaster, Yorkshire.*
- 1830 Long, George, Esq., M.A. 29, *St. George's-road, Brighton.*
- 1839 \*Long, Henry Lawes, Esq. *Travellers' Club; and Hampton-holme, Farnham, Surrey.*
- 1847 Longman, Thomas, Esq. *Paternoster-row; and 8, St. James-square, Hyde-park.*
- 1856 Lovett, Phillips Cosby, Esq. *Liscombe House, Bucks.*
- 1830 Lowry, Joseph Wilson, Esq. 45, *Robert-street, Hampstead-road.*
- 1830 \*Lyell, Sir Charles, M.A., LL.D., F.R.S., F.L.S., Hon. M.R.S. Ed. 53, *Harley-street, Cavendish-square.*
- 1837 \*Lynch, Capt. H. Blouie, C.B., Indian Navy, F.R.S. *Athenaeum Club.*
- 1830 MacDonnell, John, Esq. 48, *Grove-end-road, St. John's-wood.*
- 1854 McDowell, William, Esq. 28, *Threadneedle-street, City.*
- 1851 530† MacGillivray, John, Esq.
- 1856 Macgregor, Alexander, Esq. 23, *Upper Wimpole-street.*
- 1855 McGregor, Duncan, Esq. *Board of Trade; and Athenaeum Club.*
- 1839 Macintosh, Major-Gen. Alex. Fisher, R.M. *Anternony, near Glasgow.*
- 1845 \*Macintyre, Patrick, Esq., F.S.A., Off. Assoc. Inst. Act. 8, *Waterloo-place, Pall-mall; and 13, Grenville-place, Kilburn-priory.*
- 1845 Mackenzie, Right Hon. Holt, F.R.S. *Athenaeum Club; and 28, Wimpole-street.*
- 1830 Mackillop, James, Esq., F.R.S. *King's-arms-yard.*
- 1855 Mackinnon, Wm. Alex., Esq., M.P., F.R.S.
- 1852 McLeod, Walter, Esq. *Head Master of the Royal Military Asylum, Chelsea.*

Year of Election.	
1855	* Macdure, Andrew, Esq. 37, Wallbrook, City.
1855	540* M'Clure, Captain Sir Robert J. Le M., R.N. <i>H.M.S. 'Esk.'</i>
1855	Macnab, John, Esq. <i>Steed's-place, Leith Walk, Edinburgh.</i>
1832	M'Nell, Sir John, LL.D. <i>Athenæum Club; and 28, Rutland-square, Dublin.</i>
1856	* Macpherson, Dr. Duncan, M.D., Inspector-General of Hospitals. 14, St. James's-st.
1844	Macqueen, James, Esq. 18, Kensington-crescent.
1830	* Magrath, Edward, Esq. <i>Hampstead Heath.</i>
1853	Majendie, Ashhurst, Esq., F.R.S. <i>Athenæum Club; and Heddingham-castle, Essex.</i>
1845	* Major, Richard Henry, Esq. <i>British Museum.</i>
1853	Malby, Thomas, Esq. 8, Swinton-street, Gray's-inn-road.
1843	* Malcolm, W. F., Esq. <i>Burnfoot, Langholme, near Carlisle.</i>
1853	550* Mallet, Charles, Esq. <i>Audit Office; and Belmont, Hampstead.</i>
1833	* Manchester, James Prince Lee, Bishop of, F.R.S., &c. <i>Sedgley-hall, Manchester.</i>
1856	Mandeville, J. Henry, Esq., late H.M.'s Minister Plenipotentiary at Buenos Ayres. 11, Rutland Gate.
1830	* Mangles, Capt. James, R.N., F.R.S. <i>Fairfield, near Exeter.</i>
1856	Manning, Frederick, Esq. <i>Byron-lodge, Leamington.</i>
1830	* Marjoribanks, Edward, Esq. 34, Wimpole-street.
1854	Markham, Clements Robert, Esq. <i>Union Club; and 4, Onslow-square, Brompton.</i>
1836	* Markham, Edward, Esq. 45, Welbeck-street, Cavendish-square.
1854	Marshall, James Garth, Esq. 37, South-street, Grosvenor-square; <i>Healdingley, near Leeds, Yorkshire; and Monk Coniston, Ambleside.</i>
1830	* Martin, Rev. Joseph William, LL.D. <i>Keston, Kent.</i>
1850	560 Martin, R. Montgomery, Esq. 23, Gloucester-street, Camden-hill, Kensington.
1830	* Martineau, Joseph, Esq., F.R.S., F.R.S. <i>Athenæum Club; Basing-park, Alton, Hants; and Whitbread's Brewery.</i>
1845	* Matheson, Sir James, Bart., M.P., F.R.S. 13, Cleveland-rue; and <i>Achnay, Bowar-bridge, Sutherlandshire, &amp;c.</i>
1837	* Maughan, Captain P., Indian Navy, F.R.A.S. 37, Melville-street, Edinburgh.
1855	† May, Daniel John, Esq., R.N. <i>H.M.S. 'Calcutta.'</i>
1838	Melvill, Philip, Esq., F.R.A.S. <i>East India House.</i>
1854	Melville, Lieut.-Colonel, Military Secretary to the Bombay Government.
1830	* Mercier, Francis, Esq., F.R.A.
1842	* Merivale, Herman, Esq., Under Secretary of State for the Colonies. 26, Westbourne-terrace.
1854	Methuen, Captain Robert. <i>Oriental Club.</i>
1853	570* Miller, Captain Thomas, R.N. <i>Army and Navy Club.</i>
1844	Milne, Alexander, Esq., C.B., Commissioner of Woods and Forests. 29, St. James's-place.
1853	Milnes, Richard Monckton, Esq., M.P. 16, Upper Brook-street; <i>The Hall, Bawtry; and Frynton-hall, Ferribridge, Yorkshire.</i>
1837	* Milton, William Thomas Viscount, M.P., F.R.S. 4, Grosvenor-square; and <i>Wentworth-house, Rotherham, Yorkshire.</i>
1851	* Mocatta, Frederick D., Esq. 3, Langham-place.
1853	Mocatta, George, Esq. <i>Sydney.</i>
1853	Moffatt, George, Esq., M.P. 103, Abingdon-square.

Year of Election.	
1856	Montagu, Henry Seymour, Esq. <i>Thurlow-lodge, Larkhall-lane, Clapham.</i>
1849	*Montagu, Major Willoughby, <i>Clapham-common.</i>
1842	*Monteagle, Thomas Lord, F.R.S. 7, <i>Park-street, Westminster; and Mount Trenchard, Limerick.</i>
1830	580*Montefiore, Sir Moses, Bart., F.R.S., F.R.S.N.A. 7, <i>Grosvenor-gate, Park-lane; and East Cliff-lodge, Ramsgate.</i>
1850	*Monteith, Lieut.-General William, F.I.C. Eng., F.R.S. 47, <i>Gloucester-place, Portman-square; and Oriental Club.</i>
1839	Moody, Lieut.-Colonel R. C., R.E. <i>Edinburgh.</i>
1854	Moore, Major J. A., F.R.S. 19, <i>Portland-place.</i>
1853	Moorson, Captain William, R.N. <i>Army and Navy Club.</i>
1830	*Morrison, James, Esq. 57, <i>Upper Hurley-street.</i>
1839	*Mornay, Aristides Franklin, Esq., F.I.S. <i>Pernambuco, Brazil.</i>
1839	*Morris, Charles, Esq. <i>University Club.</i>
1855	Muir, Thomas, Esq. 24, <i>Fork-terrace, Regent's-park.</i>
1830	*Murchison, Sir Roderick Impey, G.E.S.T.S., M.A., D.C.L., F.R.S., F.F.G.S., and L.S., Director-General of the Geological Survey of Great Britain and Ireland, Trust. Brit. Mus., Hon. Mem. R.S. of Ed., R.I.A., Mem. Acad. St. Petersburg, Berlin, and Copenhagen, Corr. Ins. Fr., etc. etc. 16, <i>Belgrace-square.</i>
1830	590*Murdoch, Thomas William Clinton, Esq. 8, <i>Park-street, Westminster; and River-bank, Putney.</i>
1851	Murray, George, Esq. 5, <i>Austin Friars.</i>
1851	*Murray, Capt. the Hon. Henry Anthony, R.N. 40, <i>Albany-chambers, Piccadilly.</i>
1844	*Murray, James, Esq. <i>Foreign Office.</i>
1830	Murray, John, Esq. 50, <i>Albemarle-street; and Newstead, Wimbledon.</i>
1853	Napier, Col. George Thomas Conolly, C.B., Assistant Adjutant-General. <i>Canada.</i>
1857	Nares, Francis, Esq. <i>Athenæum Club.</i>
1857	Nelthropp, George, Esq. 20, <i>Gloucester-street, Belgrave-road.</i>
1857	*Nesbitt, Henry, Esq. 8, <i>Harvey-row, Canonbury, Islington.</i>
1856	Newman, Thomas Holdsworth, Esq. 14, <i>Arlington-street.</i>
1845	600 Nicolay, Rev. Ch. Grenfell, Librarian and Prof. of Geography, King's Coll.
1836	Nicolson, Sir Frederick William Erskine, Bart., Capt. R.N. 14, <i>William-street, Lozenges-square; and H.M.S. 'Pique,' Pacific.</i>
1854	Norman, Henry, Esq. 11, <i>Henrietta-street, Cavendish-square.</i>
1856	North, F. Esq., M.P. 3, <i>Victoria-st., Westminster; and Hastings-lodge, Hastings.</i>
1830	*Northumberland, Algernon Duke of, Rear-Admiral, K.G., F.R.S., F.R.A., F.R.S.N.A., Pres. R.I. <i>Northumberland-house, Charing-cross; Alnwick and Keildon Castles, Northumberland; Werrington-park, Cornwall; Sun-house, Middlesex; and Stamwick-park, Yorkshire.</i>
1855	O'Byrne, Robert, Esq. 9, <i>Adelphi-terrace.</i>
1856	O'Byrne, W. R., Esq. 9, <i>Adelphi-terrace, Strand; and Cranford, Middlesex.</i>
1856	O'Connor, Col. Luke Smyth, C.B., Governor of the Gambia. <i>United Service Club.</i>
1830	Ogle, Admiral Sir Charles, Bart. 64, <i>Eaton-place.</i>
1855	Oliphant, Laurence, Esq. <i>Athenæum Club.</i>
1853	610 Oliveira, Benjamin, Esq., M.P., F.R.S. 8, <i>Upper Hyde-park-street.</i>



Year of  
Election.

- 1845 \*Ommanney, Capt. Erasmus, R.N., F.R.A.S. *Kent-lodge, Southsea.*
- 1838 \*Ommanney, H. M., Esq. 40, *Charing-cross.*
- 1856 O'Reilly, Commander Montagu F., R.N. 4, *Brind-street, Greenwich.*
- 1855 Orr, William S., Esq. 17, *Torrington-square.*
- 1856 Osborn, Capt. Sherard, R.N., C.B., Officier Légion d'Honneur. *Hamrick, Lincolnsh.*
- 1853 Osborn, Sir George Robert, Bart. *Travellers' Club; and Chicksand-priory, Bedfordshire.*
- 1852 Oswell, William Cotton, Esq. *Burlington Hotel, Cork-street.*
- 1855 Otway, Arthur John, Esq., M.P. 18, *Chapel-street, Park-lane.*
- \*1854 Ouchterlony, James, Esq. *Madras.*
- 1844 620\*Overstone, Samuel Lord, M.A., M.R.I. 2, *Carlton-gardens; and Wickham-park, Surrey.*
- 1854 Oxenham, Rev. William, M.A. *Harrow, Middlesex.*
- 1846 \*Oxford, Samuel Wilberforce, Bishop of, F.R.S., F.A.S. 26, *Pall-mall; Out-denden Palace, Wheatley, Oxfordshire; and Lavington, Sussex.*
- 1852 Packman, Fred. W. S., Esq., M.D. 12, *Clarges-street, Piccadilly; and Cuyton-hall, Chesterfield, Derbyshire.*
- 1853 Pakington, Right Hon. Sir John Somerset, Bart., M.P. 41, *Eaton-square; and Westwood-park, Droitwich, Worcestershire.*
- 1856 Palliser, John, Esq. *Conrad, Kilmackthomas, Waterford.*
- 1855 Palmer, Captain Edmund, R.A. 3, *Wellington-terrace, Charlton, Blackheath; and Woolwich.*
- 1838 \*Palmer, Samuel, Esq.
- 1851 Palmerston, Henry John, Lord Viscount, M.P., G.C.B., F.R.S., &c. 144, *Piccadilly; and Broadlands, Romsey, Hants.*
- 1849 \*Parish, Lieut. John E., R.N. *Army and Navy Club.*
- 1838 630\*Parish, Sir Woodbine, K.C.H., F.R.S., &c. *Quarry-house, St. Leonard's-on-Sea.*
- 1852 Parker, J. Walter, Esq., jun. 445, *West Strand.*
- 1830 \*Parker, Thomas Lister, Esq., F.R.S., F.S.A. *Tabley-house, Knutsford.*
- 1850 †Parkes, Harry S., Esq. *Oriental Club; and H.M.'s Consul, China.*
- 1850 \*Parkyn, Mansfield, Esq., F.Z.S. *Arthur's Club, St. James's-street; and Woodborough-hall, Southwell.*
- 1854 Purr, Thomas Clements, Esq., M.A. 21, *West-mall, Clifton.*
- 1830 \*Pusley, Sir Charles William, K.C.B., R.E., F.R.S., Lieut.-Gen. 12, *Norfolk-crescent, Hyde-park.*
- 1854 Paulson, Commander John T., R.N. *Army and Navy Club.*
- 1847 \*Paynter, William, Esq., F.R.A.S. 21, *Belgrave-square; and Camborne-house, Richmond, Surrey.*
- 1855 Peabody, George, Esq. 22, *Old Broad-street, City.*
- 1853 640 Penock, George, Esq. 5, *Craven-hill-gardens, Hyde-park.*
- 1853 \*Peckover, Alexander, Esq. *Wimbeach.*
- 1852 Peel, Capt. William, R.N. *Whitehall-gardens.*
- 1846 \*Pelly, Sir John Henry, Bart. *Upton, Essex.*
- 1830 \*Penn, Richard, Esq., F.R.S. 8, *Lancaster-place, Richmond.*
- 1853 Percy, Colonel the Hon. Hugh M. (Guards). 8, *Portman-square.*
- 1846 Petermann, Augustus, Esq., Hon. Memb. Berl. Geog. Soc.

Year of  
Election.

- 1857 \*Peters, William, Esq. 35, *Nicholson-lane, Lombard-street.*
- 1854 Phelps, William, Esq. 18, *Montagu-place, Russell-square.*
- 1843 Phillimore, John George, Esq., Q.C., M.P. 19, *Old-square, Lincoln's-inn; and 21, Chester-square.*
- 1830 650\*Phillippe, Sir Thomas, Bart., M.A., F.R.S., F.S.S. *Athenæum Club; and Middle-hill, Broadheay, Worcestershire.*
- 1856 Phillips, John, Esq., Solicitor. *Hastings.*
- 1854 Phillips, Colonel B. Travell. *Senior United Service Club.*
- 1854 Phillips, T. Bacon, Esq. 6, *Oriental-place, Brighton.*
- 1832 Pike, Lieut.-Com. John W., R.N. 26, *Burlington-street; Junior United Service Club; and H.M.S. 'Antelope,' West Coast of Africa.*
- 1855 Pilkington, James, Esq., M.P. *Reform Club; and Blackburn.*
- 1851 \*Pim, Lieut. Bedford C. T., R.N. 22, *Docherny-square, North Shields.*
- 1856 \*Flowers, John Henry, Esq. 39, *York-terrace, Regent's-park.*
- 1834 \*Pocock, John Innis, Esq. 19, *Chester-terrace, Regent's-park; and Puckrup-hall, Tockesbury.*
- 1855 Pollesfen, Capt. J. J. *Assistant Quartermaster-General, Bombay Army.*
- 1836 660\*Pollington, John Charles George, Viscount, F.R.S.A. *Mesley-park, near Leeds.*
- 1853 Pollock, Lieut.-General Sir George, G.C.B. *Clapham-common, Surrey.*
- 1835 \*Ponsonby, Hon. Frederick G. B. 3, *Mount-street, Grosvenor-square.*
- 1857 Pope, Captain W. A. 14, *St. James's-square.*
- 1853 Porter, Edward, Esq. *Athenæum Club; and 6, Suffolk-street, Pall-mall.*
- 1855 Porter, Rev. J. Leslie, A.M. *Damascus.*
- 1830 \*Portlock, Col. Joseph Ellison, R.E., F.R.S., President G.S. *Archcliff Fort, Dover.*
- 1854 Power, John Arthur, Esq., M.A., B.M. 52, *Barton-crescent.*
- 1854 Power, John, Esq. 25, *Sumner-place, Regent's-park; and Panama.*
- 1856 Powys, the Hon. Thos. L. 10, *Grosvenor-place; and Langdon Court, Plymouth.*
- 1847 670 Pratt, F. T., Esq., D.C.L. 2, *College, Doctors'-commons.*
- 1853 Price, Jas., Esq., M.D., F.R.C.S., &c. *Gloucester-cottage, Eggar-road, Briston.*
- 1852 Price, James Glenie, Esq., Barrister-at-Law. 14, *Clement's-inn.*
- 1855 \*Pringle, Thomas Young, Esq. 14, *Eaton-square.*
- 1845 Prinsep, Henry T., Esq. *Little Holland-house, Kensington.*
- 1852 Prout, John William, Esq., M.A., Barrister-at-Law. *Athenæum Club; and Newendon-house, Willesden, Middlesex.*
- 1852 Pullen, Commander William J. S., R.N.
- 1844 Puller, Christopher William, Esq. *Youngsbury, Ware, Herts.*
- 1854 \*Quin, Captain Michael, R.N. *Senior United Service Club; and 18, Albion-villas, Albion-road, Islington.*
- 1850 Radstock, Granville George, Lord, Vice-Admiral, C.B. 26, *Portland-place.*
- 1853 680 Rae, John, Esq., M.D. 29, *Norfolk-street, Strand.*
- 1851 \*Ramsay, Capt. William, R.N., F.R.S.A. *Junior United Service Club; and 23, Ainslie-place, Edinburgh.*
- 1854 Ramsay, Sir James, Bart. *University Club; and Barony-house, Ayr, N.B.*
- 1841 Raper, Henry, Esq., R.N., F.R.S.A. 6, *Prince's-terrace, Prince's-gate, Hyde-park.*
- 1848 690 Ravenshaw, E. J., Esq., M.R.S.A. 9, *Holles-street, Coventish-square.*

Year of  
Election.

- 1844 \*Bawlinson, Colonel Sir Henry Creswicke, K.C.B., D.C.L., F.R.S. *Athenæum Club*; and 21, *Langham-place*.
- 1838 Rawson, Rawson W., Esq., Colonial Secretary. *Cape of Good Hope*.
- 1832 Raymond, Venerable Archdeacon, of Durham. *Athenæum Club*; 17, *Cumberland-street*; and *Durham*.
- 1856 Reid, Henry Stewart, Esq. 118, *Westbourne-terrace*.
- 1838 \*Reid, Sir William, B.E., K.C.D., Major-Gen. *Governor of Malta*.
- 1830 690 \*Rennie, George, Esq., C.E., F.R.S., Hon. M.R.I.A. 21, *Whitehall-place*; and *Holmwood-lodge, near Dorking, Surrey*.
- 1834 \*Rennie, M. B., Esq., C.E. 21, *Whitehall-place*.
- 1830 \*Rennie, Sir John, C.E., F.R.S., F.S.A. 5a, *Spring-gardens*.
- 1830 \*Renouard, Rev. George Cecil, B.D., M.R.A.S. *Swanscombe-rectory, near Dartford*.
- 1830 \*Renwick, Lieutenant, R.E.
- 1853 Reynolds, Joseph, Esq. *Club-chambers, Bejant-street*.
- 1857 Richards, Capt. G. H., R.N. *Torpoint, Cornwall*.
- 1830 \*Richardson, Sir John, B.M., M.D., C.B., F.R.S., L.S. *Lancrigg, Grasmere, Westmoreland*.
- 1830 \*Ripon, Frederick John, Earl of, F.R.S. 1, *Carlton-gardens*; *Norton, Slouford, Lincolnshire*; and *Putney-heath, Surrey*.
- 1830 700 \*Robe, Colonel Fred. Holt, C.B. *United Service Club*; and *Woolwich-common*.
- 1853 Robertson, Peter, Esq. (Staff Surgeon, first class). *Army and Navy Club*.
- 1853 †Robinson, Albert, Esq., C.E., F.R.S.
- 1830 \*Robinson, Captain Charles G., R.N. *H.M.S. 'Ceylon,' Malta*.
- 1850 \*Robinson, Walter F., Esq., Lieut. R.N. *Junior United Service Club*.
- 1855 Robinson, Thos. Fleming, Esq., F.L.S. 4, *Grote-park-terrace, Camberwell-grove*.
- 1856 Roche, Antonin, Esq. *Educational Institute, Cadogan-gardens*.
- 1830 \*Rodd, James Russell, Esq., M.B.I. 40, *Wimpole-street*.
- 1830 \*Roget, Peter Mark, Esq., M.D., F.R.S., F.L.S., F.G.S., M.R.I.A. 18, *Upper Bedford-place, Russell-square*.
- 1834 \*Rose, the Right Hon. Sir George, F.R.S., LL.D. 4, *Hyde-park-gardens*; and 25, *Southampton-buildings, Chancery-lane*.
- 1830 710 Ross, Charles, Esq. 60, *Portland-place*.
- 1843 \*Rouse, William, Earl of, M.A., K.P., Trust. Brit. Mus., F.R.S., F.S.A. *Birrcastle, Parsonstown, King's County, Ireland*.
- 1839 \*Rous, Rear-Admiral the Hon. Henry John. 23, *Grafton-street, Bond-street*.
- 1856 Rucker, J. Anthony, Esq. *Blackheath*.
- 1830 Rumbold, Charles Edmund, Esq., M.P., F.S.A. *Preston-house, Andover, Hants*.
- 1830 \*Russell, Jesse Watts, Esq., D.C.L., F.R.S., S.A., L.S. *Ham-hall, Staffordshire*.
- 1830 Russell, Lord John, M.P., F.R.S. 32, *Chesham-place*; *Pembroke-lodge, Richmond*; *Endleigh-house, Devon*; and *Gart-house, near Callendar, N.B.*
- 1852 Sabine, Major-General Edw., R.A., V.F.R.S., F.R.A.S., &c. &c. 13, *Ashley-place, Victoria-street, Westminster*; and *Woolwich*.
- 1847 St. Asaph, Thomas Vowler Short, Bishop of. *Palace, St. Asaph, North Wales*.
- 1840 St. Leger, Anthony Butler, Esq. 10, *Berkeley-square*; and 22, *Baker-street, Portman-square*.



Year of  
Election.

- 1845 720\* Salomons, Mr. Alderman David, F.R.A.S. 3, *Great Cumberland-place, Hyde-park; and Broom-hill, near Tunbridge Wells.*
- 1852 Saumarez, Commander Thomas, R.N. H.M.S. 'Lapwing;' and *Green Hill, Barnet.*
- 1838 Scarlett, Major-General the Hon. Sir J. Yorke, K.C.B.
- 1851 Scarlett, Lieut.-Colonel the Hon. W. F., Scots Fusilier Guards.
- 1854 Slater, George, Esq., M.A. 15, *New-street, Spring-gardens.*
- 1855 Scott, Rear-Admiral James. *United Service Club.*
- 1840 \*Scrivener, J. Frederick Pike, Esq. 20, *Bryanston-square; Ramridge-house, near Andover, Hants; and Sibton-abbey, Foxford, Suffolk.*
- 1830 \*Sedgwick, the Rev. A., Hon. M.R.I.A., Woodwardian Lecturer, M.A., F.R.S., F.R.A.S. *Athenæum Club; and Cambridge.*
- 1853 Sevin, Charles, Esq. 11, *Culham-street, City.*
- 1853 Sewell, Henry, Esq. 23, *Gresham House, Old Broad-st., City; and Stamford-hill.*
- 1853 730 Sexton, George, Esq., M.D., PH. DR. 6, *China-terrace, Kennington-road.*
- 1853 \*Seymour, Henry Danby, Esq., M.P. 39, *Upper Grosvenor-street; Knoyle-Hindon, Wilts; and Gluscombe, Somersetshire.*
- 1855 Seymour, Sir Geo. F., K.C.B., G.C.H., Vice-Admiral, *Com.-in-Chief, Portsmouth.*
- 1854 \*Shadwell, Captain Charles F. A., R.N., C.B. H.M.S. 'Highflyer;' and *Army and Navy Club.*
- 1856 Share, James Masters, Esq., R.N. 5, *Belgrave-road, Piccad.*
- 1855 Shaw, William Edward, Esq., R.N. 1, *James-street, Adelphi.*
- 1846 Sheffield, George Augustus Frederick Charles, Earl of, F.R.S. 20, *Portland-place; and Sheffield-park, Sussex.*
- 1856 Shepherd, Captain John, Deputy Master of Trinity House. 7, *Manficht-street, Cavendish-square.*
- 1856 Shuttleworth, Sir J. P. Kay, Bart. 38, *Gloucester-square; and Gouthorp-hall, Burnley, Lancashire.*
- 1853 Silk, John Alexander, Esq. 1, *Brunswick-square; and Southwood-lane, Highgate.*
- 1853 740 Silver, William, Esq., Barrister-at-Law. *Addison-road, Kensington.*
- 1853 Simmons, Edward Robert, Esq., Barrister-at-Law. 1, *Sergeants' Inn, Chancery-lane.*
- 1846 Simmons, Lt.-Col. John L. A., R.E. *Junior United Service Club.*
- 1856 Simmons, Nicholas Fenwick, Esq. 5, *Hatcham-terrace, New-cross.*
- 1853 Simpkinson, Lieut. Francis G., R.N. 22, *Arundel-street, Strand.*
- 1855 \*Simpson, John, Esq., M.D., R.N. *Malla Hospital.*
- 1835 \*Smith, Edward Osborne, Esq., F.R.A.S., &c. 243, *Bryanston-square.*
- 1853 †Smith, George, Esq. *Peru.*
- 1820 \*Smith, James, Esq., F.R.S.L. & E. *Athenæum Club; and Jordan-hill, Glasgow.*
- 1854 Smith, John, Esq., Memb. Geograph. Soc., Bombay. *Oriental Club.*
- 1855 750 Smith, John Harrison, Esq. *Panama; and 9, Upton-park Villas, Slough, Bucks.*
- 1853 Smith, John Henry, Esq. 16, *Pall Mall; and Purley, Croydon, Surrey.*
- 1835 \*Smith, Lieut.-Col. James Webber, 95th Regt. *Royal Barracks, Dublin.*
- 1838 \*Smith, Octavius Henry, Esq. *Thames-bank, Westminster.*
- 1855 Smith, Rev. Brownrigg, M.A. *Shepherd-lane, Bristol.*
- 1830 \*Smith, Sir Charles Felix, K.C.B., Lieut.-Gen. 7, *Onslow-square, Brompton; and Pedyffryn, Conwy, North Wales.*

Year of  
Election.

- 1841 \*Smith, Thomas, Esq.
- 1855 Smith, W. H., Esq., Barrister-at-Law. *Burrowsfield, Swansea.*
- 1857 Smith, Wm. Gregory, Esq. *Hudson Bay Company, Fenchurch-street.*
- 1857 Smith, Rev. R. Carter. *Stepney Rectory.*
- 1837 760 \*Smyth, Captain William, R.N. *Parkstone, near Poole, Dorset.*
- 1830 \*Smyth, Rear-Admiral William Henry, K.A.P., D.C.L., F.R.S., V.P.S.A., F.R.A.S.,  
Hon. M.R.I.A., Corr. Inst. Fr., &c. &c. *Athenæum Club; and St. John's-lodge,  
near Aylesbury, Bucks.*
- 1850 \*Smythe, Lieut.-Colonel William J., R.A. 2, *Craig's Court, Charing-cross.*
- 1840 \*Somers, Charles, Earl. *Eastnor-castle, Herefordshire; and The Priory,  
Reigate, Sussex.*
- 1855 Sopwith, Thomas, Esq., C.E., F.R.S. *Allenheads, Haydon-bridge, Newcastle-on-  
Tyne.*
- 1844 \*Sotheby, Lieut.-Col. Frederick Samuel, C.B., F.R.A.S. 3, *Portugal-street,  
Mount-street.*
- 1853 Southey, Henry Sedgfield, Esq., Barrister-at-Law. *Athenæum Club.*
- 1830 Spencer, Frederick Earl, Rear-Admiral, K.G., C.B., M.R.I. 27, *St. James's-place;  
and Althorp-park, Northamptonshire.*
- 1830 \*Spottiswoode, A., Esq. *New-street-square, Fetter-lane.*
- 1855 \*Spottiswoode, William, Esq., F.R.S. 12, *James-street, Buckingham-gate.*
- 1853 770 Stanford, Edward, Esq. 6, *Charing-cross.*
- 1855 Stanhope, Philip Henry, Earl of, Pres. Soc. of Antiquaries. 41, *Grosvenor-  
place-houses, Grosvenor-place; and Chevening, Seven Oaks, Kent.*
- 1856 Staniland, William, Esq., C.E. *The Crescent, Selby, Yorkshire.*
- 1853 \*Stanley, Edward Henry, Lord, M.P., D.C.L. 23, *Charles-street, St. James's-sq.*
- 1856 Statham, John Lee, Esq. 43, *Mortimer-street, Cavendish-square.*
- 1830 \*Staunton, Sir George T., Bart., D.C.L., F.R.S., F.S.A. 17, *Deconshire-street,  
Portland-place; Clydagh-house, Galway; and Leigh-park, Hatant, Hants.*
- 1835 Staveley, Thomas, Esq. (Foreign Office). 20, *Earl's-terrace, Kensington.*
- 1850 Steele, Colonel Thomas M., C.B., Coldstream Guards. 11, *Green-street,  
Grosvenor-square.*
- 1830 \*Stephen, Sir George.
- 1855 \*Stephenson, Robert, Esq., M.P., F.R.S., President Inst. C.E. 24, *Great George-  
street, Westminster; and 34, Gloucester-square, Hyde-park.*
- 1857 780 Stephenson, Sir R. Macdonald, C.E. 115, *Gloucester-terrace.*
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- 1853 Strutt, George H., Esq., F.R.A.S. *Milford, near Derby.*
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- SANSON.**—Atlas Nouveau, contenant toutes les Parties du Monde, etc. Par le Sieur Sanson, Géographe Ordinaire du Roy. Présenté à Monseigneur le Dauphin, par Hubert Jaillot, Géographe du Roy. Amsterdam, 1696. The complete Atlas is in 400 sheets; only 128 of the sheets unbound.
- SMITH'S** Classical Atlas, containing distinct Maps of the Countries described in Ancient History, both Sacred and Profane. 22 Maps, 4to. London, 1809.
- New General Atlas. 45 Maps, 4to. London, 1809. Bound up with Smith's Classical Atlas.
- SOCIETY** for the Diffusion of Useful Knowledge, Maps of the; an imperfect Collection in sheets.
- SPRUNGER.**—Atlas Antiquus delineavit Dr. C. de Spruner. XVII Tabulas coloribus illustratas et alias LXIV Tabellas in margines illarum inclusas continens. Folio. Gotha, 1850.
- Historisch-Geographischer Hand-Atlas zur Geschichte der Staaten Europa's vom Anfang des mittel Alters auf die neueste Zeit. Von Dr. Karl von Spruner. 73 Maps, &c. folio. Gotha, 1846.
- Historisch-Geographischer Hand-Atlas zur Geschichte Asiens, Africa's, America's, und Australiens. Von Dr. Karl von Spruner. 18 Maps, etc. Gotha, 1853.
- SYDOW.**—Methodischer Hand-Atlas für das Wissenschaftliche Studium der Erdkunde. Bearbeitet von E. von Sydow. Sheets 1 to 21, except 7, and Supplement 1 a & b to 5; 6 to 12 being wanting. (14 sheets are mounted on millboard.) Gotha, 1846.
- Wand-Atlas von E. von Sydow. Erdkarte, Europa, Asia, Afrika, N. America, S. America. Gotha, 1844.
- VRIETH AND FUNK.**—Atlas du Monde Ancien en douze Cartes Géographiques dressées par G. U. A. Vrieth, et publiées par C. P. Funke, avec des Tables Explicatives. Also, C. Ph. Funke's kurzgefasstes jedoch Vollständiges Wörterbuch der Alten Erdbeschreibung zu dessen Atlas der Alten Welt gehörig. In 1 vol. ob. 4to. Weimar, 1800.
- WILKINSON'S** Modern Atlas; 29 of the Maps only in sheets. London, 1792. Also Outline Maps—World, Europe, Asia, and Africa; 1809. Also 3 Classical Maps, &c. Imperfect.
- WILTSCHE.**—Atlas Sacre sive Ecclesiasticus, a J. E. T. Wiltsc. On 5 sheets folio and letter-press 4to. Gotha, 1843.
- WYLD.**—Geographia Sacra, or Scripture Atlas. By J. Wyld. 31 Plates, 8vo., London, 1823.

EUROPE.

- ARROWSMITH, A.—A volume containing the following Maps by A. Arrowsmith:—  
 I. *Holland*, from the map executed at the Dutch Military Dépôt. On 6 sheets. 1815.  
 II. Map of *France, Belgium, and part of Switzerland*. On 6 sheets. 1817.  
 III. Map of the Physical Divisions of *Germany*. On 6 sheets. 1812.
- CHAPPE D'AUTEROCHE.—Atlas, containing Carte Géographique et Minéralogique de la Route de Brest à Paris, et de Paris à Tobolsk en Sibérie. Par M. l'Abbé Chappe d'Auteroche. With special Maps and Sections. On 30 sheets in 1 vol. folio. Paris, 1768.
- DENAIX.—Atlas Physique, Politique, et Historique de l'Europe. Par M. A. Denaix. 30 maps. Folio. Paris, 1829.
- KRUSE.—Tabellen zur übersicht der Geschichte aller Europäischen Länder und Staaten von ihrer ersten Bevölkerung an bis zum Jahre 1800, &c. Von C. Kruse. Folio. Oldenburg, 1802.
- LE SAGE.—Genealogical, Chronological, Historical, and Geographical Atlas, exhibiting all the Royal Families in Europe, with Possessions of each Kingdom. By Mr. Le Sage. 20 Maps. Folio. London, 1801.
- SAINT-CYR.—Atlas des Mémoires pour servir à l'Histoire Militaire sous le Directoire, le Consulat et l'Empire. Par le Maréchal Gouvion Saint-Cyr. On 17 sheets. Oblong folio. Paris, 1831.
- VANDERMAELEN.—Atlas de l'Europe. 165 feuilles. Echelle, 1 : 600,000. Dessiné par H. Perkin, &c. Mounted in 14 cases. Brussels, 1833.
- WEIMAR-INST.—Europa nach seinen politisch-geographischen Veränderungen seit Ausbruch der Französischen Revolution dargestellt in Charten und Statistischen Tabellen. 1789-1816. Weimar, 1816.

ENGLAND AND WALES.

- ANDREWS.—Atlas of England. By John Andrews. Imperfect. Plates 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13. Title, &c. wanting. London, 1796.
- BOWEN.—The English Atlas; or a set of Maps of all the Counties in England and Wales. By Emanuel Bowen, &c. 43 Maps. Folio. London, 1777.
- MURRAY.—An Atlas of the English Counties. By T. L. Murray. 44 Maps. Folio. London, 1831.
- REPORTS (Parliamentary) on proposed Division of Counties and Boundaries of Boroughs in England and Wales. Parts 1 to 8, and Schedule B, in 1 vol. Folio. London, 1832.
- London—*
- ROCQUE AND HORWOOD.—Plans of London, in 1 vol. folio, containing—  
 I. A Plan of the Cities of London and Westminster, and Borough of Southwark, with the contiguous Buildings. From an actual Survey taken by John Rocque, Land Surveyor; and engraved by John Pine. On 24 sheets, scale 200 feet to 1 inch. London, 1745.  
 II. Plan of the Cities of London and Westminster, the Borough of Southwark and Parts adjoining, showing every House. By R. Horwood. On 32 sheets, scale 26 inches to a mile. London, 1799.

SCOTLAND.

- REPORTS (Parliamentary) on Boundaries of Cities, &c. in Scotland. 1 vol.

IRELAND.

- REPORTS on Boundaries of Cities, &c. in Ireland. 1 vol. London, 1832.



SWEDEN.

A Collection of 24 Maps of Sweden and its separate Divisions, &c. by the Swedish Government, Mærellius, and others, during the 18th century. In 1 vol. Folio.

RUSSIA IN EUROPE.

*Lithonia, &c.—*

MELLIN.—Atlas von Liefland und Esthland. Vom L. A. Von Mellin. On 16 sheets. Berlin, 1791-98.

*Poland—*

ZANNOVI AND FADEN—NORDMANN—SOTZMANN.—A volume containing—

- I. A Map of the Kingdom of Poland and of the Grand Duchy of Lithuania, with their dismembered Provinces and the Kingdom of Prussia. (Reduced on 1 sheet from Zannovi's Map in 24 sheets.) By W. Faden. London, 1792.
- II. Carte du ci-devant Royaume de Pologne, dans son état actuel. Par A. P. H. Nordmann. On 9 sheets. Vienna, 1813.
- III. Topographisch-Militärische-Karte vom Vormaligen Neu Ost-Preussen oder dem jetzigen Nordlichen Theil des Herzogthums Warschau nebst dem Russischen District. On 15 sheets. By D. F. Sotzmann. Berlin, 1807.

GERMANY.

REYMANN.—Geographischen Atlas von Deutschland. Von D. G. Reyman. On 342 sheets, many of which are wanting. See Index Map. Berlin, 1820-50.

WOERL.—Atlas von Süd West Deutschland und dem Alpenland. On 48 sheets. Two sheets only. Freiburg, 1831.

*Austrian Dominions—*

FUCHS.—Die Venetianer Alpen. Von Dr. W. Fuchs. Mit einer Geognostischen Karte und Profilen auf 18 Tafeln. Oblong 4to. Vienna, 1844.

JÓSEF.—Magyar Atlas az az Magyar, Horvát, és Tót. Folytatta és végezte Márton József, a' Bécsi Univ. Prof. Atlas Hungaricus seu Regnorum Hungarie, Croatia, et Slavoniz, Mappæ, &c. 60 Maps. 1 vol. folio. Vienna, 1802-11.

*Russia—*

TOPOG. BUREAU.—Topographischen Atlas vom Königreich Bayern, von den Topog. Bureau des Königl. Bayer. Generalquartiermeister-Stabs. On 112 sheets; size of each 22 inches by 34; scale 1:50,000. (Sheet 110 in duplicate.) Munich, 1831.

*Prussia.*

SCHROETTER—GILLY.—Atlas, containing—

- I. Karte von Ost-Preussen nebst Preussisch Lithauen und West-Preussen nebst dem Netzdistrict. Aufgenommen unter Frey Herrn von Schroetter, in 1796-1802. On 25 sheets.
- II. Special Karte von Süd-Preussen auf der grossen topog. Vermessungs-Karte reducirt, vom Ob. Hau-Rath Gilly. On 12 sheets. Berlin, 1802, 3.

*Saxony—*

LEUTEMANN.—Historischer Atlas von Sachsen in 25 illuminirten geographischen Charten mit Erläuterungen über die Vergrößerungen und Verkleinerungen dieses Landes von 950 bis zum Jahre 1815. Leutemann, &c. Oblong 4to. Leipzig, 1816.

*Württemberg—*

TOPOG. BUREAU.—Topographischen Atlas des Königreich Württemberg in 55 Blättern. Von dem Statist. topog. Bureau. 1821-1831. Size of each sheet, 22 inches by 22; scale, 1:50,000. Sheets 54, 55, and Title are wanting.

BELGIUM.

FERRARIS.—Carte Chorographique des Pays-Bas Autrichiens. Par le Comte de Ferraris. On 25 sheets. In 1 vol. folio. 1777.

CAPITAINE AND CHANLAIRE.—Carte chorographique de la Belgique, en 69 feuilles, dressée d'après celle de Ferraris. Augmentée et publiée par L. Capitaine et P. G. Chanlaire. 1 vol. oblong folio. Paris, without date.

FRANCE.

CASSINI.—Carte de France, levée par ordre du Roy. Par Messrs. Maraldi et Cassini de Thury. On 180 sheets. Sheets 1 to 175, with Index and General Map of Triangulation. In 3 vols. folio. Paris, 1736.

• CHANLAIRE.—Atlas National de France (en départements) dressé en 1803. Par P. G. Chanlaire, revu en 1818. Complete in 110 sheets. Only 8 sheets.

POIRSON.—Statistique Générale et Particulière de la France et de ses Colonies, &c. Collection de 19 Tableaux et 9 grandes Cartes enluminées. Par J. B. Poirson. 1 vol. 4to. Paris, 1804. Also, the remainder of the work in 7 vols. 8vo.

*Normandy—*

DENIS.—Atlas Topographique de l'ancienne Province de Normandie et pays limitrophes. Par Louis Denis, 1770. Revu par H. Brûé. On 16 sheets, in 1 vol. 4to. Paris, 1817.

SPAIN.

BOURGOING.—Atlas pour servir au Tableau de l'Espagne moderne. Par J. F. Bourgoing. 15 plates, 4to. Paris, 1803.

SUCHET.—Atlas. Mémoires du Maréchal Suchet sur ses Campagnes en Espagne, 1808-1814. 16 Maps, &c. folio. Paris, 1828.

SWITZERLAND.

DUFOUR.—Topographischen Atlases der Schweiz. G. Dufour direxit, 1842. To be completed in 25 sheets; scale, 1:100,000. Sheets 2, 3, 4, 5, 6, 7, 11, 16, 17, 21.

SCHREUBMAN, KELLER, &c.—Atlas der Schweiz. 19 sheets. Imperfect. Title, &c. wanting.

• WEISS.—Atlas Suisse, par J. H. Weiss. On 16 sheets, with general map on 1 sheet. 1 vol. folio. Also another set mounted to fold separately. Aarau, 1786-1820.

*Cantons St. Gall and Appenzell—*

ZIEGLER, &c.—Topog. Atlases der Cantone St. Gallen und Appenzell. Von J. M. Ziegler, &c. On 16 sheets. Winterthur, 1840-46.

ITALY.

*Tuscany—*

ORLANDINI.—Atlante Geografico, Fisico e Storico del Granducato di Toscana. Di Attilio Zuccagni-Orlandini. 20 sheets. 1 vol. folio. Florence, 1832.

*Pontifical States—*

OLIVIERI.—Atlanti degli Stati Pontifici. Presso la Calco Camerale; Bern. Olivieri, inc. On 6 sheets, without general title. Rome.

*Two Sicilies—Naples—*

BARTOLI.—Atlante del Regno di Napoli, divisa in distretti e circondarj, secondo il decreto del 1<sup>o</sup> Maggio 1816. Incisa per ordine di S. E. il Ministro dell' Interno (da G. Bartoli). On 15 sheets. Naples, 1816.

*Two Sicilies—Naples—*

MARZOLLA.—Atlante Geografico, Amministrativo e Statistico, Fisico e Storico del Regno di Napoli. Eseguita sotto la direzione dell'autore B. Marzolla. On 15 sheets.

RICCI.—Picciolo Atlante Geografico-Statistico del Regno di Napoli, disposto e ridotto da Celestino Ricci. Svo. 1813.

ZANNONI.—Atlante Geografico del Regno di Napoli da G. A. Rizzi Zannoni. On 31 sheets. Naples, 1808.

———Atlante del Regno di Napoli, ridotto in vi fogli da Gio. Ant. Rizzi Zannoni, corrected to 1853.

*Sicily—*

MARZOLLA.—Atlante dei Reali Dominj al di là del Faro, eseguita sotto la direzione dell'Autore B. Marzolla. On 8 sheets. Naples, 1853.

WALTERSHAUSEN.—Atlas des Actœa, von W. Sartorius von Waltershausen. 4th part. Göttingen, 1853.

GREECE.

KIEPERT.—Topographisch-Historischer Atlas von Hellas und den Hellenischen Colonien in 24 Blättern unter mitwirkung des Professors Carl Ritter, bearbeitet von H. Kiepert. 24 Maps. Berlin, 1846.

SONNINI.—Atlas to Sonnini's Travels in Greece. English Edition. 4 Maps, a facsimile of firman folded, and 4 plates, 4to. in stiff cover. Imperfect.

IONIAN ISLES.

BORY DE ST. VINCENT.—Nouvel Atlas des Iles Ioniennes. Revu par Mr. le Col. Bory de Saint Vincent. 18 plates, &c. 4to. Paris, 1823.

ASIA.

BERGHAC'S Atlas von Asia. Sheets 6, 8, 9, 10, 12, 13. Size 40 inches by 27. Gotha, 1839.

KLAPROTH.—Tableaux historiques de l'Asie, depuis la monarchie de Cyrus jusqu'à nos jours, précédés de recherches historiques et ethnographiques. Par J. Klaproth. Atlas, 27 Maps. Paris, London, Stuttgart, 1826.

RITTER.—Atlas von Asien zu Carl Ritter's Erdkunde. Sheets 1, 3, 4, 5 of Part 2 and Part 3. Berlin, 1834-52.

ZIMMERMANN'S Atlas von Vorder Asien zur allgemeinen Erdkunde von C. Ritter. Part 1; sheet 4 and letterpress of Part 3; Parts 4, 5, 6. Imperfect.

RUSSIAN DOMINIONS.

LEDEBOUR.—Atlas zu Ledebour's Reisen (Government of Tomsk), 12 sheets in cover. Berlin.

CHINESE DOMINIONS.

D'ANVILLE.—Nouvel Atlas de la Chine, de la Tartarie Chinoise et du Thibet, ainsi la Carte de Corée, levée par ordre de l'Empereur Cang-Hi, par les PP. Jésuites, etc. Rédigée par Mr. D'Anville. Précédé d'une description de la Boucharie. 42 Maps, folio. The Hague, 1757.

. The same, 10 sheets only.

INDIA.

TRIG. SURVEY.—Atlas of India, on a scale of four miles to an inch, from the Trigonometrical Survey made by order of the Government. Size 27 inches by 40. Sheets 25, 26, 27, 40, 47, 49\*, 60, 65, 66, 69, 78\*, 124, 125, 129\*, 130, 131, 138, mounted. Sheets, 42\*, 43\*, 47, 48, 49, 57, 58, 59, 60, 61, 63, 65, 66, 69, 70, 75, 76, 77, 78, 80, 81, 93, 124, 125, 129, 130, 131, 138, unmounted. (There are two copies of the Nos. marked \*.)



BENGAL.

RENNELL.—A Bengal Atlas. By James Rennell. 22 Maps, etc., folded in 4to. London, 1781.

SOUTH INDIA.

ARROWSMITH.—Atlas of South India in eighteen sheets, from Cape Comorin to the River Kistnah; delineated on a scale of four English miles to one inch. By A. Arrowsmith. London, 1822.

AFRICA.

RITTER.—Hand Atlas von Afrika in Vierzehn Blatt zur allgemeinen Erdkunde von Carl Ritter und F. A. O'Etzel. Two Copies. Berlin, 1831.

AMERICA.

CARY AND LEA.—A complete Historical, Chronological, and Geographical American Atlas. 53 sheets. 1 vol. folio. Philadelphia, 1823.

HUMBOLDT.—Atlas Géographique et Physique du Royaume de la Nouvelle-Espagne, par Al. de Humboldt. 20 plates, folio. Paris, 1812.

— Atlas Géographique et Physique des Régions équinoxiales du Nouveau Continent. Par Al. de Humboldt. First Part, containing Nos. 1, 15, 18, 19, and 26 of the Maps, with Title-pages. Folio. Paris, 1814.

MISCELLANEOUS collection of American Maps, bound together in 1 large vol. folio.

ATLANTIC.

CANARY ISLANDS.

BUCH.—Atlas zur physicalischen Beschreibung der Canarischen Inseln von Leopold von Buch. Folio. Imperfect, wanting the Maps of Teneriffe and Grand Canaria. Berlin, 1825.

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MAPS.

THE WORLD.

ANDRIVEAU.—Carte comparative et synchrone de l'étendue territoriale des trois grandes puissances, France, Angleterre, Russie, pendant le dernier siècle 1740-1840. Andriveau, edit. Paris (on 2 Maps of the World). Size, 36 inches by 25; scale, 16° on the equator to 1 inch.

ARROWSMITH, A.—Hydrographical Chart of the World, according to Wright's or Mercator's projection, delineated by A. Arrowsmith, 1811. Additions to 1814-1819. London. On 8 sheets; size of each, 25 inches by 31; scale, 4° on the equator to 1 inch.

ARROWSMITH, S.—Western Hemisphere, by S. Arrowsmith, 1839. Size, 40 inches by 40; scale, 5° on the equator to 1 inch.

BLUMENBACH.—MS. Outline of the World, showing Blumenbach's distribution of the races of mankind. Size, 9 inches by 12.

BOUDIN.—Carte Physique et Météorologique du Globe Terrestre, comprenant la distribution géographique de la Température, des Vents, des Pluies, et des Neiges. Par J. Ch. M. Boudin. Paris, 1853. Size, 22 inches by 33; scale, 12° on the equator to 1 inch.

BREITENBAUCH.—Vorstellung der Welt nach der Ausbreitung der Vornehmsten Völkerschaften, Von G. A. von Breitenbauch. 1786. Size, 20 inches by 25.

D'ANVILLE.—Orbis veteribus notus. Auctor D'Anville, 1763. London, 1794. Size, 22 inches by 31.

- D'ANVILLE.—*Orbis Romani pars occidentalis et orientalis*. Auctor D'Anville, 1763. London, 1794. 2 sheets; size of each, 28 inches by 22; scale, 1" to 1 inch.
- DENAIX.—*Mappemonde Comparative, ou nouveau Planisphère, contenant la charpente des deux continents, leurs grandes divisions naturelles, et les rapports homologues des principales contrées du monde avec les pays de l'Europe*. Par Denaix, 1823. Paris. Size, 32 inches by 42; scale,  $12^{\circ}$  on the equator to 1 inch.
- *Tableau synoptique et comparatif des principales Divisions géographiques du Globe, etc., dressé pour faciliter l'étude de la Mappemonde Comparative des Essais de Géographie*. Par Denaix. 1828. Paris.
- D'HALLOY.—*Essai d'une Carte ethnographique du Globe, d'après les divisions de J. J. d'Onaluis d'Halloy*. Paris, 1853. Size, 27 inches by 38.
- DOVE.—*Isothermen des Januar und Juli, von H. W. Dove*. Size, 23 inches by 29.
- *Monthly Isothermals from January to June, and July to December, by H. W. Dove*. 2 sheets. Size of each, 25 inches by 23.
- DUPERRÉY.—*Carte générale des Méridiens et des Parallèles Magnétiques du Globe Terrestre, tels qu'ils résultent des observations de la Déclinaison de l'Aiguille aimantée, raménées à l'année 1825*. Par M. L. J. Duperréy. 1836. *Voyage de la Coquille*. Size, 24 inches by 36.
- EVANS.—*Geographical and Physical Map of the World, showing the British Possessions, etc.* By Smith Evans. 1842. Size, 18 inches by 25.
- GARDNER.—*The World, etc., Delineation of the present state of Geographical Knowledge*. By James Gardner. London, 1825, without title. Size, 34 inches by 49; scale,  $4^{\circ}$  equatorial to 1 inch.
- GRASMÜLLER.—*Vergleichende Übersicht der grössten Ströme der Erde*. Bearbeitet von E. Grasmüller. München, 1835. Size, 11 inches by 16; scale, 1 to 11,240,000.
- HUGHES.—*The British Dominions on a uniform scale equal to 1:25,000,000 of the natural magnitude. Compiled and engraved by W. Hughes for the National Society*. London, 1848. Size, 14 inches by 18.
- KELLER.—*Erd Charte nach der Bonne'schen Projection alle für die Erdkunde ergiebigen Entdeckungs-Reisen zu Wasser und zu Lande von der Mitte des 9ten Jahrhunderts bis jetzt darstellend*. Von H. Keller. Weimar, 1814. Size, 26 inches by 45.
- KRUSENSTERN.—*Allgemeine Welt Charte nach Mercator's projection, entworfen von A. J. von Krusenstern, Capitain der Russischen Marine*. London, 1815. Size, 25 inches by 37; scale,  $10^{\circ}$  on the equator to 1 inch.
- LA PÉROUSE.—*Mappemonde ou Carte réduite des parties connues du Globe. Atlas du Voyage de La Pérouse, fait dans les années 1785, 86, 87, et 88*. Size, 18 inches by 22; scale,  $20^{\circ}$  on the equator to 1 inch.
- LAPIE.—*Orbis Romanus ad illustranda itineraria Antonini Bardigalense, tabulam Pentingerianam, periplos, itineraria, maritima, delineatus a P. Lapie*. Latetiae, 1833. With Supplement, 10 sheets; size of each 18 inches by 24.
- ROBERTS.—*A general Chart exhibiting the discoveries of Captain James Cook*. By Lieut. Henry Roberts, R.N. Size, 24 inches by 36.
- SABINE, J.—*Map of the World, in which is represented the moral state of all mankind, particularly the progress Christianity is making*. By James Sabine. London, 1815. Size, 23 inches by 31; scale,  $12^{\circ}$  on the equator to 1 inch.
- SCHMIDT.—*Gebirgs und Gewässer Karte der Erde*. Von J. M. F. Schmidt. Berlin. In 2 parts. Size of each, 22 inches by 24.
- SCHNURRER.—*Charte über die Geographische Ausbreitung der Krankheiten, von F. Schnurrer, Med. Doc.* Munich, 1827. Size, 15 inches by 21.

- SCHRAEML.**—General Karte sämtlicher Entdeckungen auf den drei grossen Weltreisen des Kapit. Jakob Cook. Verfasst von H. Roberts, Lieut. Neu herausg. von F. A. Schraembl. Vienna, 1789. 2 sheets; size, 24 inches by 36.
- SCHULZE.**—Naturgrænzen Karte von Europa, Asien, und Africa. Von J. M. F. Schulze. Size, 19 inches by 25.
- STEPHANI.**—Oro-hydrographische weltkarte in Mercator's Projection. Von A. A. F. Stephani (Zu V. Roon's Leitfaden). Size, 20 inches by 25; scale, 16° on the equator to 1 inch.
- STREIT.**—Die Ostliche Halbkugel der Erde in Stereographical Aequatorial Projection entworfen von F. W. Streit. Nuremberg, 1816. Size, 24 inches by 20.
- TENGSTREMA.**—The Eastern and Western Hemispheres. Physical Map in Russian, by Lit. Tengstroma? printed in colours. No title. St. Petersburg, 1847. 2 sheets; size of each 24 inches by 24.
- WEILAND.**—Vergleichende uebersicht der Binnen-Meere und Ausgezeichneten Seen der Oestlichen und Westlichen Hemisphaere. Von C. F. Weiland. Weimar, 1833. Size, 21 inches by 26.
- — — — — Hohen Karte oder bildlich vergleichende Uebersicht der bedeutendsten Berge in Europa, Asien, Africa, America, und Australien. Von C. F. Weiland. Weimar, 1834. Size, 12 inches by 21.
- WEIMAR INSTITUTION.**—Strom Charte oder vergleichende Uebersicht der Laenge der haupt Ströme der Erde. Weimar, 1827. Size, 22 inches by 26.
- WYLD.**—Chart of the World, showing the religion, population, and civilization of each country. By J. Wyld. London, 1818. Size, 21 inches by 32; scale, 13° to 1 inch.
- ZIEGLER.**—Karte über die geographische Verbreitung des Kameels, mit der geographischen Verbreitung der Dattelpalme, durch J. M. Ziegler. Berlin, 1848. Size, 20 inches by 28.

## THE POLES.

- ARROWSMITH, A.**—Map of the Countries round the North Pole. By A. Arrowsmith. London, 1818. Size, 25 inches by 25; scale, 14 inch to 5°.
- The same, revised. London, 1835.

## EUROPE.

### GENERAL MAPS.

- ANDREWS.**—A Political, Historical, Astronomical, and Commercial Chart of Europe. To show relatively the situation of places by the rays of the sun, the rumb of the wind, and hours of the day, from the meridian and parallel of London, on which are delineated the zones and climates, with the track of the Carthaginians, &c., with the rectiline distance in circles of 100 miles each. Plate 6. By J. Andrews. London, 1797. Size, 21 inches by 24.
- ARROWSMITH, A.**—Map exhibiting the great post-roads, physical and political divisions of Europe. By A. Arrowsmith. London, 1810. On 4 sheets; size of each, 32 inches by 42; scale 24' to 1 inch.
- BRUÉ.**—Carte Physique, Routière, et Politique de l'Europe, indiquant les limites des états d'après les derniers traités de paix. Par A. H. Brué. Revue et aug. par Ch. Picquet. Paris, 1838. On 4 sheets; size of each, 25 inches by 35; scale, 50' to 1 inch.
- CARY.**—Sketch of the Russian Campaign in 1812. Map, with remarks in letter-press. Size, 34 inches by 27.



- **D'ANVILLE.**—Germany, France, Italy, Spain, British Isles, in an intermediate Century between Ancient and Modern Geography. By M. D'Anville, 1771. London, 1812. Size, 21 inches by 20; scale  $72^f$  to 1 inch.
- DENAIX.**—Carte de l'Analyse Géographique Naturelle de l'Europe, présentant l'application d'une nomenclature propre à déterminer la dépendance mutuelle des sections hydrogèques. 11<sup>e</sup> Carte de l'Atlas Physique, &c., par Denaix. Size, 17 inches by 24.
- Carte Hydrogèque ou Squelettographique de l'Europe Centrale, dressée pour l'étude de la Géographie naturelle. Par M. A. Denaix. Paris, 1833. Size, 22 inches by 30; scale,  $14$  inch to  $1^\circ$ .
- Carte Hydrogèque ou Squelettographique de l'Europe Centrale, &c. Par M. A. Denaix. Paris, 1833. Size, 21 inches by 28; scale,  $1\frac{1}{2}$  inch to  $1^\circ$ .
- DESJARDINS.**—Statistische übersicht sämtlicher Europäischen Staaten. Von C. Desjardins. Munich, 1832. Size, 18 inches by 22.
- FRORIEP.**—Geologische Karte, No. 2. Geologische Elementar-Karte (1ster Blatt) Urgebirge. Elie de Beaumont's relativen Alter. Skizze der Richtungen in einigen Gebirgs Systemen. Karte von Europa, &c. Weimar, 1838. Size, 32 inches by 20.
- GÖTZE.**—Europa. Von F. Götz. Weimar, 1815. Size, 20 inches by 24; scale,  $5^\circ$  to  $2\frac{1}{2}$  inches.
- GÜSEFELD.**—Carte Itinéraire de l'Europe pour le Guide des Voyageurs de M. Reichard. Par M. Güsefeld. Weimar, 1802. Size, 23 inches by 31; scale,  $72^f$  to 1 inch.
- HINRICHS.**—Gemeinnützige Post und Wege Karte durch Europa mit Ausschluss von Island, Lappland, Finland, &c. Von J. C. Hinrichs. Leipzig, 1816. Size, 24 inches by 32; scale,  $65^f$  to 1 inch.
- Neue Politische-Militärische und Post Karte vom ganzen Französischen Reiche welche England, den Rheinbund, die Schweiz, das Königreich Italien und Spanien bis Madrid umfasst. Von J. C. Hinrichs. Leipzig, 1812. In 48 sheets, mounted in 4 parts. Size, 60 inches by 64; scale, 4 inches to  $1^\circ$ .
- KLÖDEN.**—Gebirgs und Gewässer Karte von Europa, West Asien, und Nord Afrika. Von C. F. Klöden. Berlin, 1814. Size, 23 inches by 30; scale,  $2^\circ$  to 1 inch.
- Hydrographische Kart von Europa, einem Theil von Asien und Afrika, zur leichtern Uebersicht der durch die von J. G. Braumüller vorgeschlagene wichtige Verbindung des Sen mit dem Dniester möglich gewordenen Wasserstrassen. Von C. F. Klöden. Size, 18 inches by 24; scale,  $3^\circ$  to 1 inch.
- LICHTENSTERN, V.**—Karte von den Mitteleuropäischen Staaten, oder von den Erbmonarchien Oestreich und Preussen, dann den sämtlichen deutschen und polnischen Ländern, von J. M. Freiherrn von Lichtenstern. On 64 sheets. Vienna, 18—. Size of each, 11 inches by 13; scale, 7 inches to  $1^\circ$ .
- \* \* \* The following sheets are wanting:—1, 2, 3, 8, 9, 16, 17, 18, 24, 25, 26, 33, 41, 49, 50, 57, 58. Those in the collection are mounted in 6 parts.
- MALCHUS.**—Karte zur übersichts der Gebirgssysteme und Flussgebiete in Europa, Zu von Malchus Militair Geographic von Europa, 1833. Heidelberg. Size, 20 inches by 26; scale,  $2^\circ$  to 1 inch.
- OLSEN.**—Esquisse Orogaphique de l'Europe, par J. H. Bredsdorff et O. N. Olsen en 1824; corrigée et considérablement augmentée par O. N. Olsen en 1830; gravée par P. J. Seehusen. Copenhagen. Size, 26 inches by 24; scale,  $1:6,543,100$ , or  $90^f$  to 1 inch. (2 copies.)

- PICQUET ET MAGINEL.**—Carte du Théâtre de la Guerre en Allemagne, en Autriche, et en Italie; où se trouvent tracés les Marches, Positions, Batailles, et Combats de la Grande-Armée commandée en personne par S.M. l'Empereur Napoléon, pendant la campagne de 1805, et ceux de l'Armée d'Italie, commandée par S. Ex. le Maréchal Masséna. Par Picquet et Maginel. Paris. Size, 23 inches by 32; scale, 2<sup>1</sup> to 1 inch.
- RAUMEN.**—Versucht Geognostischen Karte Frankreich Grosbritannien einem Theile Deutschlands und Italiens. Carl Mare, sculptit. Size, 24 inches by 18.
- RHEINWALD.**—Kriegstheater der Teutschen und Franzoesischen Graenzlanden zwischen dem Rhein und der Mosel. 1794-1799. Von J. L. C. Rheinwald. Mannheim. 6 sheets. Size of each, 25 inches by 35.
- ROCHETTE, DE LA.**—Isles Britanniques, Pays Bas, et Provinces Unies, Allemagne, Suisse, France, Italie, Espagne, et Portugal. Pour l'itinéraire de M. Dufès. Par De la Rochette. London, 1786. Size, 20 inches by 20; scale, 72' to 1 inch.
- ROSENBERG.**—Allgemeine übersichts Karte zu der Geschichte des Feldzugs vom Jahr 1799. No. 1. Gezeich. Hauptm. Rosenberg, &c. Size, 20 inches by 24; scale, 23' to 1 inch.
- SANSON.**—Théâtre de la Guerre des Couronnes du Nord. Carte nouvelle, &c. Où sont les estats de Suède, de Dannemarq, et de Pologne, l'Empire Allemagne, et les XVII. Provinces de Pays Bas. Avec les routes de Paris. Par le Sr. Sanson. Amsterdam. Size, 20 inches by 24.
- SCHMIDT AND MARE.**—Europa, von J. M. F. Schmidt und Carl Mare. Berlin, 1819. Size, 22 inches by 24; scale, 2° to 1 inch.
- SORRIOT.**—Carte Générale Orographique et Hydrographique de l'Europe, &c. Par le Général Baron Sorriot de l'Hos. Vienna, 1816. Size, 48 inches by 56; scale 1" to 1 inch. (2 copies.)
- General Karte von Europa. Worinnen die Gestalt dieses Erdtheiles zu ersehen ist, wie selbe nach seinem Höhengsysteme und Wasserzuge angeordnet ist. Entworfen von Freyherrn v. Sorriot. Vienna, 1818. Size, 24 inches by 28; scale, 2° to 1 inch. (2 copies.)
- SOTZMANN.**—General Karte von Deutschland, der Batavischen und Helvetischen Republik, Ober und Mittel Italien und dem Ostlichen Theil der Französischen Republik. Von D. F. Sotzmann. Berlin, 1803. Size, 42 inches by 30; scale, 21' to 1 inch.
- STEPHANI.**—Oro-hydrographische Karte von Europa. Von A. A. F. Stephani. (Zu v. Roons's Leitfaden.) Size, 22 inches by 24; scale, 2° to 1 inch.
- STIELER.**—Nordwestliches Deutschland (enth. Die Westl. Preussischen Provinzen, das Königr. Hannover, die Chur. u. Grosshz. Hessischen Lande, Oldenburg, Braunschweig, Nassau, &c.) und Kgr. der Niederlande. Stieler's Hand Atlas, No. 21. Size, 18 inches by 15; scale, 2<sup>1</sup>/<sub>2</sub> inches to 1°.
- TARDIEU.**—Carte des Routes des Postes de l'Empire Français, du Royaume d'Italie, et de la Confédération du Rhin. Par P. Tardieu. Paris, 1814. On 4 sheets. Size of each, 24 inches by 32.
- TRAUX, DE.**—Carte Générale et Itinéraire de l'Europe, divisée en tous ses États, d'après le Congrès de Vienne et autre Traités postérieurs. Par Max. de Traux, Colonel, &c. Vienna, 1818. Size, 55 inches by 65; scale, 2 inches to 1°.
- ULRICH.**—Neueste post Karte durch ganz Deutschland, Helvetien, Ober Italien, Oestreich, Ungarn, Pohlen, Preussen, Dänemark, Holland, and Frankreich bis Paris. Von C. F. Ulrich. Frankfurt, 1820. Size, 24 inches by 28.
- VANDERMALEN.**—Carte de l'Europe Centrale, comprenant le tracé général des Chemins de Fer, 1840. Brussels. 2 sheets. Size, 32 inches by 48; scale, 3 inches to 1°.
- WANTHIER.**—Geo-chronologische Karte von Europa von M. Wauthier, &c. Munich, 1829? Size, 24 inches by 27.



WEIMAR INST.—Carte de la Route de Leipzig par Prague à Vienne, dressée en bandes à la manière Anglaise. Weimar, 1802. Size, 15 inches by 20.

————— Carte de la Route de Leipzig à St. Pétersburg, dressée en bandes à la manière Anglaise. Weimar, 1802. Size, 15 inches by 20.

WOERL.—Assemblage zur Karte von Central Europe. 60 sheets by Wörl. 1 sheet. Size 9 inches by 9.

Central Europe. Sheets 41, 80, 91, with an Index Map (sheet No. 102) of same size to the whole of the Map in 132 sections, and another Index to a part of the same Map in 35 sections. Author, &c., not named. Size of each sheet, 8 inches by 11; scale, 4 inches to 1°.

## GREAT BRITAIN AND IRELAND.

### GENERAL MAPS.

PETERMANN.—Hydrographical Map of the British Isles, exhibiting the Geographical Distribution of the Inland Waters. By A. Petermann. Size, 34 inches by 23; scale, 1:1,600,000. London, 1849. (2 copies.)

MELA BRIT.—Great Britain in Departmental Divisions—Ireland in Departmental Divisions. By Mela Britannicus. Separate maps, on different scales, but mounted together. Size, 25 inches by 26. London, 1822.

## GREAT BRITAIN.

BRADSHAW'S Map of the Railways in Great Britain, showing the projected Lines to the present time, 1845. Size, 18 inches by 15. The same for 1846.

CARY'S Reduction of his large Map of England and Wales, with part of Scotland, &c., 1796-1811. Size, 30 inches by 25; scale, 15 miles to 1 inch.

HORSLEY.—Britanniae Antiquae Tabula Geographica ex Aevi Romani Monumentis. Ab J. Horsley, M.A. Size, 24 inches by 21; scale, 34 inches to 1°.

HUGHES.—Britannia Romana. By W. HUGHES, 1843. Size, 27 inches by 16; scale, 24 inches to 1°.

————— Political Map of England and Wales and part of Scotland. By W. Hughes (for the National Society). 1848. Size, 18 inches by 14; scale, 1:1,750,000.

LAURIE AND WHITTLE'S New Map of the Inland Navigation of England and Wales, with that of Scotland to the South of Edinburgh and Glasgow. By N. Colman. London, 1808-16. Size, 32 inches by 25; scale, 12' to 1 inch.

SMITH'S new Map of the Navigable Canals and Rivers of England, Wales, and Scotland, distinctly showing the length of each Line, and the Dates of the Acts of Parliament which have passed for executing the same. London, 1815. Size, 42 inches by 31; scale, 10' to 1 inch.

WALKER.—Map of the Inland Navigation, Canals, and Railroads, with situations of the various Mineral Productions throughout Great Britain. By J. Walker, accompanied by a Book of Reference, by Joseph Priestley. Wakefield, 1830. Six sheets; size, 75 inches by 63; scale, 5' to 1 inch.

WYLD.—Railway Map of Great Britain, &c. By James Wyld (1846). Size, 36 inches by 24.

## ENGLAND AND WALES.

### GENERAL MAPS.

ANDREWS.—A new Physical, Historical, and Political Map of England and Wales, &c. By John Andrews. 1786. London. Size, 64 inches by 53; scale, 11' to 1 inch.

ARROWSMITH, A.—Map of England and Wales, the result of fifteen years' labour. By A. Arrowsmith. 1815; additions to 1816. London. (On 18 sheets; size of each, 27 inches by 40; scale, 3 statute miles to 1 inch.



**ARROWSMITH, A.**—Map of the Rivers, Canals, and great Roads of England and Wales, reduced from a drawing of 3 miles to 1 inch, whereon are delineated most of the places ascertained by the Trigonometrical Survey. By A. Arrowsmith. 1813. London. On 4 sheets; size of each, 36 inches by 31; scale, 6 statute miles to 1 inch.

\* \* This is an unfinished proof with the hills drawn in.

**A MAP** showing the Parliamentary Representation of England and Wales, containing Divisions of Counties, principal places of County Election, County Polling Places, principal and contributory Boroughs, &c., according as the same are settled by the Reform Act, passed June 7th, 1832. Size, 29 inches by 21; scale, 4 inches to 1°.

**FORDYCE.**—Comitatus Anglorum; being a brief but comprehensive Synopsis of Statistical and Political Arithmetic, containing the English Counties, &c. By Mr. Fordyce. 1806. Size, 22 inches by 27.

**ORDNANCE** Map of England and Wales. In 110 sections; scale, 1 inch to a statute mile. Section 59; 60; 61 N.W., N.E., S.W.; 62; 71 N.W.; 74; 75; 76; 77 N.E., S.E.; 78; 79.

The Index Map. South sheet unfinished. Scale, 1 inch to 10 statute miles.

**ORDNANCE.**—Diagram of the Great Triangles in the Trigonometrical Survey of England and Wales, with the Heights of the several Stations, and some other Hills, &c. London, 1811. Size, 25 inches by 22; scale, 34 inches to 1°.

**PETERMANN.**—England and Wales, distribution of the Population. Census of 1851. By A. Petermann. Size, 17 inches by 13.

#### COUNTIES OF ENGLAND.

*Berks—*

**ROCQUE.**—Topographical Map of the County of Berks. By John Rocque, &c. 1761. On 18 sheets, mounted in 6 parts; size of each part, 32 inches by 36; scale, 2 inches to an English mile.

——— Map of the County of Berks reduced from an Actual Survey in 18 sheets. By the late John Rocque, &c. 1762. Size, 20 inches by 28; scale, 2 miles to 1 inch.

*Cornwall—*

**MARTIN.**—Complete Index to Martin's large Map of the County of Cornwall, &c. 8vo. Bodmin, 1816.

*Cumberland—*

**DONALD.**—The County of Cumberland, drawn from the large Map, in six sheets; surveyed by Thomas Donald; with portions of Lancaster and Westmoreland, comprehending all the Lakes in that neighbourhood. London, 1810. Size, 26 inches by 35; scale, 2 English miles to 1 inch.

*Dorset—*

**TAYLOR.**—The County of Dorset, surveyed by Isaac Taylor. Reduced from the large Map, in six sheets. London, 1796. Size, 22 inches by 31; scale, 2 English miles to 1 inch.

**CARY.**—Dorsetshire. By John Cary. 1809. Size, 9 inches by 11; scale, 5' to 1 inch.

*Durham—*

**ARMSTRONG.**—The County Palatine of Durham, surveyed by Captain Armstrong, and engraved by Thomas Jefferys. 1768, corrected to 1791. The North-west sheet only; size of it, 20 inches by 25.

**CARY.**—Durham. By John Cary. 1793. Size, 9 inches by 11; scale, 4' to 1 inch.

——— New Map of Durham. By John Cary. 1811. Size, 20 inches by 22; scale, 2½ English miles to 1 inch.

*Hampshire—*

CARY.—Isle of Wight (Cary). 1812. Size, 7 inches by 9.

*Hertfordshire—*

DURY AND ANDREWS.—A Topographical Map of Hertfordshire. By And. Dury and J. Andrews. London, 1782. In 4 parts; size of each, 31 inches by 43; scale 2 inches to 1 English mile.

*Huntingdonshire—*

ELLIS.—Map of the County of Huntingdon, surveyed in 1823 and 1824. By T. J. Ellis. London, 1829. Size 48 inches by 41; scale, 1 English mile to 1 inch.

*Kent—*

ORDNANCE.—An entirely new and accurate Survey of the County of Kent, with part of the County of Essex. Done by the Surveying Draftsmen of H.M. Hon. Board of Ordnance, &c., under Capt. W. Mudge, R.A., F.R.S. London, 1801. On 4 sheets; size of each, 24 inches by 36; scale, 1 mile to an inch.

A Map of the County of Kent, drawn from the Topographical Survey taken by order of the Hon. Board of Ordnance, &c.; reduced from the large Map, &c. London, 1807. Size, 24 inches by 35; scale, 2 miles to 1 inch.

*Leicestershire—*

OAKDEN.—Map of the Country round Leicester, Melton-Mowbray, and Loughborough. By C. Oakden. Leicester, 1830. Size, 17 inches by 18; scale, 3 English miles to 1 inch.

*Nottinghamshire—*

Plan of the Parish of Eastwood, in the County of Nottingham. Size, 14 inches by 9; scale, 6 inches to 1 mile.

*Westmoreland—*

WALKER.—Westmoreland. By J. and C. Walker. 1836. Size, 14 inches by 16; scale, 3 English miles to 1 inch.

*Worcestershire—*

CARY.—New Map of Worcestershire. By John Cary. 1801. Size, 20 inches by 24; scale, 2½ English miles to 1 inch.

Map of Lickey Hill, Worcestershire, between Bromsgrove and Birmingham. Size, 10 inches by 8; scale, 2 inches to 1 mile. (Four copies.)

*Yorkshire—*

NEWTON.—Map of British and Roman Yorkshire. By Charles Newton. Drawn and engraved by W. Hughes. London, 1847. Size 26 inches by 32; scale, 4 miles to 1 inch.

WALKER.—East Riding of Yorkshire. By J. and C. Walker. London, 1836. Size, 14 inches by 16; scale, 3 to 1 inch.

CANALES OF ENGLAND.

BRADSHAW'S Map of Canals, Navigable Rivers, Railways, &c., in the Southern Counties of England; with Heights. Size, 39 inches by 74; scale, 2 English miles to 1 inch.

——— Map of Canals, Navigable Rivers, Railroads, &c., in the Midland Counties of England; with Heights. Manchester, 1830. Size, 54 inches by 52; scale, 2 English miles to 1 inch.

——— Map of Canals situated in the Counties of Lancaster, York, Derby, and Chester; with heights. Size, 37 inches by 54; scale, 2 English miles to 1 inch.

GILES.—Plan of the intended Arundel and Portsmouth Canal, surveyed under John Rennie, Esq. By N. and F. Giles. 1815. Size, 11 inches by 30; scale, 1 mile to 1 inch.

- LUFFMAN.**—Plan of a Canal proposed to be made between Croydon and Portsmouth, &c. By John Luffman. 1804. Size, 14 inches by 18.
- RENNIE.**—Line of the proposed Ship Canal from Bridgewater to Seaton. Surveyed under the direction of John Rennie, Esq. By Messrs. Bond and Dean. Size, 11 inches by 7.
- TELFORD.**—Map of the South-West Parts of England and Wales, showing the proposed Ship Canal between Beer Harbour and Bridgewater Bay. Made under the direction of Thomas Telford. 1824. Size, 13 inches by 24.
- Map of the River Thames Navigation from London Bridge to Lochlade. 1813. Size 9 inches by 21.
- Plan showing the connection of Canals and Navigable Rivers by the proposed North-Eastern Canal. Size, 11 inches by 7.
- Plan of Navigations connected with the proposed Grand Union Canal from near Harboro' to the Grand Junction Canal; with Observations. Size 16 inches by 9.
- Plan of a proposed Canal to connect the Rivers Arun and Wey, in the Counties of Sussex and Surrey. 1813. Size, 9 inches by 17.
- Profilés des Canaux qui forment la Ligne Navigable communiquant entre Liverpool et Londres. Size, 8 inches by 17.
- Tableau Hydrographique des Canaux Navigables de l'Angleterre. 1819. Size 24 inches by 27; scale, 12' to 1 inch.

#### RAILWAYS AND ROADS OF ENGLAND.

- GIBBS.**—London and Windsor Railway. Plan of an Intended Railway. By J. Gibbs, Engineer. 1833. Six sheets and title in cover.
- LANDMANN.**—Plan of an Intended Line of Railway from Greenwich to Gravesend. By G. Landmann. 1835. Size, 11 inches by 19; scale, 1 mile to 1 inch.
- STOREY.**—Plan and Section of an intended Railway, to be called the Great North of England Railway, commencing at the River Tyne, &c., and terminating at the River Tees, &c. T. Storey, Engineer.
- Plan and Section of Extension of the Great North of England Railway from the River Tees to the City of York. T. Storey, Engineer.
- WILLIAMS.**—Plan of an intended Dram Road from or near Carno Mill, &c., Monmouthshire, to Sea Lock, below Cardiff, &c. By P. Williams. 1799. Size, 12 inches by 31; scale, 1½ inch to 1 mile.
- Map of the South-Eastern Railways and the competing Lines to Brighton. 1837. On a card, size 4 inches by 5½.
- Map of the South-Eastern Railway, showing also the Junction with the Brighton Railway. Size, 15 inches by 20; scale, 4 miles to 1 inch.
- Road Maps.—No. 1, Irthing Bridge to Northumberland, Ainstable to Warwick; No. 2, Great Salkeld to Armathwaite, Dalemmain to Edenhall, Ulleswater.

#### CITIES, ETC., OF ENGLAND.

- Bath*—
- MARSHALL.**—A new and accurate Plan of the City of Bath (Marshall's). 1740. Size, 19 inches by 15.
- THORPE.**—A Map of Five Miles round the City of Bath, on a scale of 1 inch and a half to a mile, from an actual Survey made by Thomas Thorpe; with Alterations, &c., to the present time. 1773. Bath. Size, 17 inches by 17.
- Liverpool*—
- AUSTEN.**—Liverpool with its Parliamentary and Municipal Boundaries, &c. By Henry Austen, Surveyor. Liverpool, 1834. Size, 16 inches by 21; scale, 4 inches to 1 mile.



# lxxxiii *Library and Map-Room of the Royal Geographical Society—*

## *London—*

**DONALDSON.**—Plan for an improved Communication between Holborn and Oxford-street. By Thomas L. Donaldson, Architect. 1825.

**GWILT.**—Sketch of Plan proposed for Villas at East Park, Hampstead. By J. & J. S. Gwilt. 1844. Size, 26 inches by 14; scale, 170 feet to 1 inch.

**HORWOOD.**—Plan of the Cities of London and Westminster, &c. By R. Horwood. Complete in 32 sheets. Only sheets A 1, 2, 3, 4; B 1, 2, 3, 4.

**PAGE.**—Plan of proposed Embankment and Public Terrace on the North side of the Thames between Blackfriars and Westminster Bridges. By Thomas Page, c.e., &c. Size, 15 inches by 26; scale, 260 feet to 1 inch.

**TRENCH'S** New Plan of London, &c. 1826. Size, 18 inches by 26.

Plan of the Sites of the Houses of Parliament, Westminster Hall, &c. 1834. Size, 24 inches by 36; scale, 32 feet to 1 inch.

Lithographic Sketch of the North Bank of the Thames from Westminster Bridge to London Bridge, showing the proposed Quay and some other Improvements suggested by Lieut.-Colonel Trench; with a Survey, &c. 1825. Ten sheets in a cover.

## *St. Albans—*

**STUKELEY.**—Verulamium Urbs, Town of St. Albans; MS. Plan. By William Stukeley. 1721. Size, 12 inches by 20. Also, St. Albans Abbey; MS. Plan. Size, 15 inches by 18.

## *St. Leonards—*

Map of the Vicinity of St. Leonards. 1829. With a View of the Hotel, Baths, &c. Size, 15 inches by 10.

## *Weymouth—*

**HARVEY.**—Plan of Weymouth (Harvey's). 1800? Size, 11 inches by 9.

## WALES.

### GENERAL MAPS.

**COLTMAN.**—A new Map of South Wales. By Nathaniel Colman. London, 1812. Size, 22 inches by 29; scale, 4 miles to 1 inch.

### COUNTIES OF WALES.

#### *Cardiganshire—*

**SINGER.**—New Map of Cardiganshire. By Joseph Singer. London, 1803. On 4 sheets. Size, 40 inches by 54; scale, 1 inch to a mile.

### TOWNS OF WALES.

#### *Swansea—*

Environs of Swansea. Without title. Size, 17 inches by 27; scale, 1 inch to an English mile.

## SCOTLAND.

### GENERAL MAPS.

**AINSLIE.**—Scotland with its Islands, drawn from the surveys of John Ainslie, &c. (Paden). 1813. London. Size, 32 inches by 22; scale, 11 miles to 1 inch.

**PETERMANN.**—Scotland. Distribution of the Population. Census of 1851. By A. Petermann. Size, 12 inches by 16; Scale, 314 miles to 1 inch.

COUNTIES OF SCOTLAND.

*Aberdeen, &c.*—

ROBERTSON.—Topographical and Military Map of the Counties of Aberdeen, Banff, and Kincardine, with parts of those of Forfar, Perth, Inverness, and Moray; exhibiting a true picture thereof, constructed and delineated from actual surveys on trigonometrical, perspective, and optical principles—being the second of this kind yet published, my (the author's) Map of Jamaica having been the first—&c. By James Robertson, A.M., F.R.S. London, 1822. 6 sheets; size, 29 inches by 38; scale, 1 mile to 1 inch.

*Argyllshire*—

LANGLANDS.—Argyllshire, from actual survey. By George Langlands and Son. London, 1801. 4 sheets; size of each, 24 inches by 30; scale, 2 miles to 1 inch.

*Ayrshire*—

JOHNSON.—Ayrshire. Compiled from estate plans, &c. By William Johnson, &c. Edinburgh, 1828. (Northern and Southern parts together.) Size, 52 inches by 40; scale, 1 mile to 1 inch.

THOMSON.—Johnston's Map of the County of Ayr. By A. E. Thomson, etc. 1839. Edinburgh. 4 sheets; size of each, 21 inches by 27; scale,  $1\frac{1}{4}$  mile to 1 inch.

*Edinburghshire*—

KNOX.—Map of the Shire of Edinburgh or County of Mid Lothian. By John Knox. 1812. 4 sheets; size of each, 25 inches by 33; scale,  $1\frac{1}{4}$  inch to 1 mile.

*Inverness-shire*—

SMITH.—Map of part of Inverness-shire, showing the situation of the estates of Glengarry and Inverlochy Castle, part of Lochaber, &c. Adjusted from Arrowsmith, by G. Campbell Smith. Banff, 1840. Size, 21 inches by 15; scale, 4 miles to 1 inch.

— Map of the lands of Glengarry lying in the County of Inverness, &c. By G. Campbell Smith. Banff, 1840. Size, 28 inches by 20; scale,  $1\frac{1}{4}$  inch to 1 mile.

— Map of the lands of Inverlochy Castle lying in the County of Inverness, etc. By G. Campbell Smith. Banff, 1840. Size, 28 inches by 20; scale,  $1\frac{1}{4}$  inch to 1 mile.

*Lanarkshire*—

JOHNSON.—Lanarkshire. 1840. By W. Johnson, Edinburgh. 2 sheets; size of each, 22 inches by 29; scale,  $1\frac{1}{4}$  mile to 1 inch.

CITIES, ETC. OF SCOTLAND.

*Edinburgh*—

GELLATLY's new Map of the Country 12 miles round Edinburgh. 1833. Size, 16 inches by 21; scale, 1 mile to 1 inch.

KNOX.—Plan of Edinburgh and its Environs, from a survey. By James Knox. 1834. Edinburgh. Size, 20 inches by 26; scale, 11 inches to 1 mile.

LAURIE.—Plan of Edinburgh and the Country adjacent. By John Laurie. 1811. Size, 20 inches by 29; scale,  $1\frac{1}{4}$  inch to 1 mile.

*Glasgow*—

M'PHUN.—Glasgow and Suburbs (M'Phun). Size, 12 inches by 19.

IRELAND.

GENERAL MAP.

ARROWSMITH.—Ireland. By S. Arrowsmith. London, 1832. 4 sheets; size of each, 38 inches by 30; scale,  $3\frac{1}{4}$ ' to 1 inch.

*lxxxiv Library and Map-Room of the Royal Geographical Society—*

**BEAUFORT.**—New Map of Ireland, Civil and Ecclesiastical. By the Rev. D. A. Beaufort, LL.D., &c. (1792). Second Edition. 1797. Size, 45 inches by 36; scale,  $7\frac{1}{2}$  miles to 1 inch.

**ORDNANCE.**—Map of Ireland to accompany the Report of the Land Tenure Commissioners. 1845. Showing the places visited by the Commissioners and the relative proportion of the Surface of each County lying between certain lines of altitude (coloured in contours). Size, 36 inches by 24; scale, 10 miles to 1 inch.

**TAYLOR.**—New Map of Ireland, having the great features of the country described in a manner highly expressive, &c. By Alexander Taylor, Lieutenant, R.E. Dublin, 1793. Size, 30 inches by 24; scale, 11 miles to 1 inch.

COUNTIES OF IRELAND.

*Antrim—*

Map of the County of Antrim. Size, 16 inches by 12; scale, 4 miles to 1 inch.

*Armagh—*

Map of the County of Armagh, reduced, &c., from Rocque's Survey. Size, 13 inches by 16; scale, 2 miles to 1 inch.

*Carlow—*

Map of the County of Carlow (Allen), Dublin, 1798. Size, 24 inches by 23; scale, 1 mile to 1 inch.

Map of Carlow County, in which the great features of the country are delineated. Size, 12 inches by 12.

*Cork—*

Map of the County of Cork. Size, 14 inches by 20; scale, 5 miles to 1 inch. (3 copies.)

*Donegal—*

**M'CREA.**—Map of the County of Donegal. By W. M'Crea. 1801. Size, 50 inches by 60.

*Down—*

**WILLIAMSON.**—Map of the County of Down. By James Williamson. 1810. Size, 50 inches by 42; scale, 1 mile to 1 inch.

*Dublin—*

**TAYLOR's** Map of the environs of Dublin, &c. Dublin, 1816. Size, 36 inches by 32; scale,  $1\frac{1}{2}$  inch to 1 mile.

Improvements of the Rivers Liffey and Dodder, County Dublin. (No title, &c.) Size, 13 inches by 20; scale, 5 inches to 1 mile.

*Galway—*

Plans of 114 estates in County Galway, Ireland, with an Index Map. Folded in a cover. Also 2 copies of the Index Map extra.

*Kildare—*

**TAYLOR.**—Map of the County of Kildare. By Major Taylor, R.E. Size, 20 inches by 16; scale, 2 miles to 1 inch.

*Kilkenny—*

**TAYLOR.**—County of Kilkenny, engraved by J. Taylor. Donnybrook, 1802. Size, 20 inches by 15; scale,  $2\frac{1}{2}$  miles to 1 inch.

*Leitrim—*

Sketch of the County of Leitrim. Size, 10 inches by 8.

*Longford—*

**EDGEWORTH.**—Map of the County of Longford from actual survey, and verified by Trigonometrical and Astronomical Observations. By William Edgeworth, under the orders of the Grand Jury of the County of Longford. London, 1813. 4 sheets; size of each, 27 inches by 24; scale,  $1\frac{1}{2}$  inch to 1 mile.



*Tyrone—*

Map of the County of Tyrone. By W. M'Crae. 1802. Size, 15 inches by 20.

*Waterford—*

NIMMO.—Plan of the Works of the Harbour of Danmore. By Alexander Nimmo, F.R.S. 1818. Size, 9 inches by 11.

*Wicklow—*

NEVILL.—County of Wicklow. By A. R. Nevill. Size, 40 inches by 27; scale,  $1\frac{1}{2}$  mile to 1 inch.

# MINOR BRITISH ISLES.

*Heligoland—*

GELL.—Plan of Heligoland from a Map found on the Island in the possession of Sir William Gell, showing the extent in the 8th, 13th, and 17th Centuries. Size, 13 inches by 15; scale,  $2\frac{1}{2}$  inches to 1 mile.

RODOWICZ.—Karte von Heligoland. Von T. Rodowicz. Berlin, 1847. Size, 31 inches by 39.

*Scilly—*

The Islands of Scilly. Part of a Map of England, the Title of which is unknown. Size, 5 inches by 5.

# DENMARK.

## GENERAL MAP.

CARY.—New Map of the Kingdom of Denmark, &c. By John Cary. 1819. Size, 20 inches by 22. Scale, 4 inches to 1°.

DE WIT.—Insularum Danicarum ut Zeelandiæ, Fionii, Langelandiæ, Lalandiæ, Falstriæ, Fembræ, Monæ, aliarumque in Mari Balthico sitar. Descriptio per F. de Wit Amstelodami. Size, 20 inches by 24; scale 6' to 1 inch.

OLSEN.—Kongeriget Danmark med Hertugdømmet Slesvig. Udgivet af General Staben. 1846. Udarbejdet af O. N. Olsen. Size, 42 inches by 34; scale, 1:480,000.

## PROVINCES OF DENMARK.

*Fyen—*

WESSEL.—Kort over den nordlige deel af Fyen med tilgrænsende kyster af Jylland og Schleswig, under det Kongl. Videnskabernes Societets Direction, &c. Af C. Wessel, 1780. Size, 24 inches by 36; scale,  $1\frac{1}{2}$ ' to 1 inch.

*Island—*

REINECKE.—Island nach Murdochischer Projection, von J. C. M. Reinecke. Weimar, 1804. Size, 20 inches by 22; scale, 12' to 1 inch.

*Jutland, North—*

MANNA.—Nordrejylland. Af J. H. Manna, Captain, &c. 1841. 9 sheets. Size of each, 18 inches by 23; scale, 1:160,000, or 2' to 1 inch.

*Moen, &c.—*

SHANKE.—Kort over Moen, Falster, og Laaland, under det K. V. Soc. Direction, &c. Af H. Shanke. 1776. Size, 24 inches by 36; scale 2' to  $1\frac{1}{2}$  inch.

*Seeland—*

WESSEL AND SHANKE.—Kort over Siaslland og Moen midt tilgrænsende Kyster, &c. under det K. V. S. Direction, &c. Af C. Wessel og H. Shanke. 1777. Size, 25 inches by 28; scale, 4' to  $1\frac{1}{2}$  inch.

lxxxvi *Library and Map-Room of the Royal Geographical Society—*

*Scotland—*

WESSEL.—Siaelland, in 4 sheets, with separate titles, forming a continuous map:—

1. Den Nord-Ostlige fjerdedeel af Siaelland under det Kongl. V. Soc. Direction, &c. af Caspar Wessel, 1768.
2. Den Syd-Ostlige fjerdedeel af Siaelland, &c. 1770.
3. Den Syd-Vestlige fjerdedeel af Siaelland, &c. 1772.
4. Den Nord-Vestlige fjerdedeel af Siaelland, &c. 1771.

Size of each sheet, 24 inches by 28.

CITIES OF DENMARK.

*Copenhagen—*

KROBS.—Grundtegnung af den Kongelige Residence og Faestning Kiöbenhavn med omliggende egn. Tegnet af A. C. Krobs, &c. 1806. Size, 21 inches by 32.

SWEDEN AND NORWAY.

GENERAL MAP.

HAHR.—Geografisk och Militär Statistik Karta öfver Sverige och Norrige, &c. af August Hahr, Capitain. Stockholm, 1845. 4 sheets. Size, 64 inches by 45; scale, 1:1,250,000.

SOTZMANN.—General Karte von Schweden und Norwegen nach den Schwedischen Karten des Freyh. von Hermelin und den dänischen des Conferenraths Erichsen und Pontoppidan über Norwegen, &c. Von D. F. Sotzmann, 1808, Nuremberg. Size, 22 inches by 28; Scale, 50' to 1 inch.

NORWAY.

GENERAL MAPS.

PONTOPPIDAN.—Det Sydlige Norge ester Kongelig Allernaadigst Befalning under Bestijrelse af Hr. Conference-Raad J. Erichsen. Ved C. J. Pontoppidan. Copenhagen, 1785. Size, 41 inches by 28; scale 11' to 1 inch.

— Det Nordlige Norge, &c. af C. J. Pontoppidan, 1795. Size, 22 inches by 28; scale, 20' to 1 inch.

MUNCH.—Kart over Norge til Brug ved Elementer-Underrisningen, udarbejdet af P. A. Munch. 1845. Christiania. Size, 22 inches by 17; scale, 1:1,800,000.

DIVISIONS (AMTS) OF NORWAY.

*Agershus Amt—*

RAMM AND MUNTHE.—Kart over Agershus Amt, &c. Hans Kongelige H. Jos. Frants Oscar, Norges og Sveriges Kronprinds underdanigst tilegnet af forfatterne. N. Ramm Capitaine, og G. Munthe Capitaine. 1827. Size, 24 inches by 18; scale, 2' 40" to 1 inch.

*Grevskabernes Amt—*

RAMM AND MUNTHE.—Kart over Grevskabernes Amt, &c. N. A. Ramm og G. Munthe, Capitaines. 1832. Size, 22 inches by 20; scale, 2' 40" to 1 inch.

*Hedemarkens Amt—*

RAMM AND MUNTHE.—Kart over Hedemarkens Amt. N. Ramm og G. Munthe. 1829. 3 sheets. Size, 66 inches by 30; scale 2' 40" to 1 inch.

*Smaalehmenes Amt—*

RAMM AND MUNTHE.—Kart over Smaalehmenes Amt. Af N. Ramm og G. Munthe. 1826. Size, 22 inches by 18; scale, 2' 40" to 1 inch.

SWEDEN.

GENERAL MAP.

ÅKERLAND.—Charta öfver Sverige med Tilgränzande Länder utgifven af Fr. S. G. Hermelin. 1797. Renoverad af E. Åkerland, 1809. Size, 22 inches by 24; scale, 50' to 1 inch.

EDSTRÖM.—Karta öfver Stamleden till Norra Canalsystemet med Föreslagne Canal-utgreningar. Ur de af Öfverste Lieut. och Ridd. J. Edström, &c. 1840. 10 sheets:—

1. Title.—2. Dedication.—3. Statistics.—4. General Karta.—5. Wettern och Hjelmarens Canal.—6. Wenern och Hjelmarens Canal.—7. Hjelmaren och Mälarens Canal.—8. Mälaren och Barkens Canal, &c.—9. Barken och Siljans Canal, &c.—10. Mälaren och Yngarens Canal.

HALLSTRÖM.—Karta öfver Swerike och Norra delen af Sverige. Utgifven af Geografiska Inrättningen. 1811. Författad af C. P. Hallström. Size, 38 inches by 24; scale, 10' to 1 inch.

Wattendragen och Watten Communicationerne i södra delen af Sverige. Sammandragen af C. P. Hallström år 1835. Size, 38 inches by 27; scale, 11' to 1 inch.

HERMELIN.—Charta öfver Sverige med tilgränsande Länder Kongl. Maj. Konung Gustaf IV. Adolph i underdänighet tilegnad af S. G. Hermelin. 1797. Size, 22 inches by 24; scale, 50' to 1 inch.

DIVISIONS OF SWEDEN.

*Angermanland, &c.*—

HERMELIN.—Charta öfver Angermanland Medelpad och Jämtland efter den af Landshöfdingen Frhr. P. A. Ornsköld år 1771 utgifne Charta med Tilläggningar af Friherre S. G. Hermelin. 1797. Size, 21 inches by 25; scale, 9' to 1 inch.

*Carlstad*—

HALLSTRÖM.—Carta öfver Carlstads Höfdingdöme, eller Warmeland. Utgifven af S. G. Hermelin. Författad af C. P. Hallström. 1808. Size, 50 inches by 37; scale, 2' 40" to 1 inch.

*Elfsborg*—

FORSSELL.—Karta öfver Elfsborgs Höfdingdöme. Utgifven af S. G. Hermelin. Författad af Carl G. Forssell. 1808. Size, 40 inches by 24; scale, 2' 40" to 1 inch.

*Gästrikland*—

HERMELIN.—Charta öfver Gästrikland och Helsingland, &c. Af S. G. Hermelin. 1796. Size 25 inches by 23; scale, 6' to 1 inch.

*Götarike*—

HALLSTRÖM.—Karta öfver Götarike eller södra delen af Sverige. Af S. G. Hermelin. Författad af C. P. Hallström. 1807. Size, 36 inches by 24; scale, 10' to 1 inch.

*Göteborg*—

FORSSELL.—Karta öfver Göteborgs och Bohus Läns Höfdingdöme. Utgifven af S. G. Hermelin. Författad af C. G. Forssell. 1806. Size, 38 inches by 24; scale, 2' 40" to 1 inch.

*Gottland*—

HALLSTRÖM.—Karta öfver Gottland eller Wisby Höfdingdöme. Utgifven af S. G. Hermelin. Författad af C. P. Hallström. 1805. Size, 38 inches by 24; scale, 2' to 1 inch.



lxxxviii *Library and Map-Room of the Royal Geographical Society.*

*Halmstad—*

FORSSELL.—Karta öfver Halmstads Höfdingdöme eller Halland. Utgifven af S. G. Hermelin. Författad af C. G. Forssell. 1807. Size, 36 inches by 25; scale, 2' 40" to 1 inch.

*Herjedalen—*

HERMELIN.—Charta öfver Herjedalen. Författad efter F. A. U. Cronstedt, och efter Observationer vid en Resa år 1796 af A. Swab, och C. M. Robsahm, på S. G. Hermelin. 1797. Size, 19 inches by 23; scale, 6' to 1 inch.

*Jönköping, &c.—*

HALLSTRÖM.—Karta öfver Jönköpings, Kronobergs, och Blekinge Höfdingdöme. Utgifven af S. G. Hermelin. Författad af C. P. Hallström. 1809. Size, 35 inches by 25; scale, 1:300,000.

*Kopparberg—*

HALLSTRÖM.—Charta öfver Kopparbergs, Säckers, Näsgräds, och Wäster Bergslagens Fögderier Stora Kopparbergs Höfdingdöme. Utgifven af S. G. Hermelin. Författad af C. P. Hallström. 1800. Size, 25 inches by 26; scale, 3' to 1 inch.

*Kopparberg, Stora—*

HALLSTRÖM.—Charta öfver Stora Kopparbergs Höfdingdöme eller Dalarne. Utgifven af S. G. Hermelin. Författad af C. P. Hallström. 1800. Size, 24 inches by 25; scale, 6' to 1 inch.

*Malmöhus, &c.—*

HALLSTRÖM.—Karta öfver Malmöhus och Christianstads Höfdingdömen eller Skåne. Utgifven af Geografiska Inrättningen 1812. Författad af C. P. Hallström. Size, 41 inches by 37; scale 2' to 1 inch.

*Nyköping—*

HALLSTRÖM.—Charta öfver Nyköpings Höfdingdöme. Utgifven af S. G. Hermelin. Författad af C. P. Hallström. 1804. Size, 24 inches by 26; scale, 2' 40" to 1 inch.

*Örebro—*

HALLSTRÖM.—Charta öfver Örebro Höfdingdöme. Utgifven af S. G. Hermelin. Författad af C. P. Hallström. 1803. Size, 33 inches by 21; scale, 8' to 1 inch.

*Östergötland—*

HALLSTRÖM.—Karta öfver Östergötland. Utgifven af S. G. Hermelin. Författad af C. P. Hallström. 1810. Size, 25 inches by 28; scale, 3' 30" to 1 inch.

*Skaraborg—*

FORSSELL.—Karta öfver Skaraborgs Höfdingdöme. Utgifven af S. G. Hermelin. Författad af C. G. Forssell. 1807. Size, 25 inches by 27; scale, 3' to 1 inch.

*Stockholm—*

HERMELIN.—Charta öfver Stockholms Höfdingdöme. Efter Samuel af Ugglas, &c. Utgifven af S. G. Hermelin. 1802. Size, 37 inches by 24; scale, 3' to 1 inch.

*Upsala—*

HALLSTRÖM.—Charta öfver Upsala Höfdingdöme. Utgifven af S. G. Hermelin. Författad af C. P. Hallström. 1801. Size, 27 inches by 20; scale, 3' to 1 inch.

*Wästerbotten—*

HERMELIN.—Charta öfver Wästerbotten och Svenske Lappmarken. På S. G. Hermelin, &c. 1796. Size, 22 inches by 24; scale, 20' to 1 inch.

*Wästerås—*

HERMELIN.—Charta öfver Wästerås Höfdingdöme. Utgifven af S. G. Hermelin. 1800. Size, 24 inches by 26; scale, 8' to 1 inch. (2 copies.)

## RUSSIA IN EUROPE.

### GENERAL MAPS.

**SUCHTELEN, &c.**—**ПОДРОБНАЯ КАРТА РОССИЙСКОЙ ИМПЕРИИ**, &c. Map of the Russian Empire (in Europe). By Gr. M. Gen. von Suchtelen and Maj-General Oppermann, at the Imperial Map Dépôt, St. Petersburg. 1801 to 1804. Complete on 100 sheets in 25 parts, with Supplements on 13 sheets in 4 parts, including the Index Map. Scale, 11' to 1 inch.

———— The Index Map to the above; another copy.

**SUCHTELEN, &c.**, FRENCH EDITION.—*Carte de la Russie Européenne, traduite et gravée par ordre du Gouvernement, au Dépôt Général de la Guerre, en 1812, 1813, et 1814, d'après la Carte Russe, en 104 feuilles. Paris, 1814. In 77 sheets, with title sheet and Index Map. Size of each, 21 inches by 32; scale, 1: 500,000 or 7' to 1 inch.*

The Index contains a Russian Alphabet and Glossary.

**VILBRECHT.**—*Carte Générale de l'Empire de Russie, divisée en quarante et un Gouvernemens. Rédigée en 1800. Comp. par Alex. Vilbrecht. Size, 29 inches by 60; scale, 100' to 1 inch.*

*Hydrographische Karte vom Europäischen Russland. Size, 24 inches by 20; scale, 1 inch to 1°.*

### SOUTHERN RUSSIA.

**IMP. MAP DÉPÔT.**—**ПОДРОБНАЯ МИЛИТЕРНАЯ КАРТА по ГРАНИЦАМ РОССИИ СЪ ТУРЦІЕЮ**, &c. Military Map of the Frontiers of Russia and Turkey. Imperial Map Dépôt, 1800. On 12 sheets in 2 parts. Size, 45 inches by 70; scale, 13 versts to 1 inch.

Map of the South of Russia. Intended to exhibit its principal physical and geological features, &c. (Unfinished copy.) Size, 18 inches by 22; scale, 18' to 1 inch.

### DIVISIONS OF EUROPEAN RUSSIA.

#### *Crimea—*

**MUKIN, MAJ-GEN.**—**ВОЕННАЯ ТОПОГ. КАРТА ПОЛУОСТРОВА КРЫМА**, &c. Military Topographical Map of the Crimea, by Major-Gen. Mukin, 1816. Engraved at the Imperial Map Dépôt, St. Petersburg, 1817. The original map on 10 sheets. Size of each, 25 inches by 19; scale, 24' to 1 inch. Only the 4 eastern sheets, mounted in 2 parts; 6 sheets are wanting.

— A Lithograph of the same, by Major T. B. Jervis, R.A.S. London, 1854. In 4 parts. Size of each, 25 inches by 45; scale, 24' to 1 inch. With a Supplement on a separate sheet, containing "Chart of the Harbour of Akhtiar or Sevastopol." Size, 11 inches by 20.

#### *Finland—*

**HERMELIN's** Swedish Maps of Finland, in six sheets:—

1. *Charta öfver Storfurstendömet Finland utgifven på S. G. Hermelin's anstalt och Omkostnad. 1799. Size, 23 inches by 25; scale, 24 inches to 1°.*
2. *Charta öfver Uleaborgs Höfdingedöme. 1798.*
3. ——— *Wasa Höfdingedöme, &c. 1798.*
4. ——— *Abo och Björneborgs Höfdingedöme. 1799.*
5. ——— *Nylands och Tavastehus samt Kymmegårds Höfdingedöme. 1798.*
6. ——— *Sawolax och Karelens eller Kuopio, &c.*

*Finland—*

IMP. ACAD.—КАРТА ГЕОГРАФ. ФИНСКАГО ЗАЛИВА &c. Geographical Map of the Gulf of Finland. By the Imperial Academy. 1770. Size 24 inches by 62; scale, 6' to 1 inch.

Monrepos, Plan von (a country-seat near Viborg, Finland). Size, 16 inches by 26.

*Kaluga—*

RUSSIAN GOVERNMENT.—ГЕОМЕТ. КАРТА КАЛУЖСКАГО НАМЪСТНИЧЕСТВА. Map of Kaluga Government, 1779. Size, 25 inches by 39; scale 8 versta to 1 inch.

*Livonia, &c.—*

VALCK.—Tabula Ducatum Livonise et Curlandiae, &c., per Gerardum Valck. Size, 20 inches by 24; scale, 12' to 1 inch.

*Poland—*

FADEN.—Map of the Kingdom of Poland and Grand Duchy of Lithuania, including Samogitia and Curland, divided according to their dismemberments. With the kingdom of Prussia. By W. Faden, 1799. North part only.

GÜSEFELD.—Charte von Polen, nach den bewährtesten Hülfsmitteln und dem Theilungs-Tractat vom Jahr 1795. Von F. L. Güsefeld. Weimar, 1806. Size, 20 inches by 23; scale, 35' to 1 inch.

Charte von Polen, nach dem Frieden zu Tilsit vom 9 July, 1807. Von F. L. Güsefeld. Weimar, 1807. Size, 20 inches by 23; scale, 35' to 1 inch.

HAAS.—Carte des partages de la Pologne en 1772, 1793, et 1795. Composée avec des caractères mobiles par G. Haas. Bâle. Size, 11 inches by 12; scale, 70' to 1 inch.

IMP. MAP DEPÔT.—ТАБЛИЦА Семитопографической карты части Западной границы РОССИЙСКОЙ ИМПЕРИИ. Index to a Topographical Map of the western part of the Russian Empire, Poland, &c. Size, 13 inches by 13.

КАРТА ЦАРСТВА ПОЛЬСКАГО. Map of Poland. Imperial Map Dépôt, 1816. Size, 30 inches by 45; scale, 10' to 1 inch.

MOILLO.—Polen unter Oesterreich, Russland, und Preussen getheilt nebst den angränzenden Ländern, bey Tranquillo Mollo. Vienna, 1815. Size, 21 inches by 29; scale, 27' to 1 inch.

PERTHES, K. DE.—A series of Maps of the Waywods or Divisions of Poland, by Karola de Perthes—

1. Woiewodztwa Krakowskiego. 1787. Size, 26 inches by 30.

2. ————— Lubelskiego. 1786. Size, 40 inches by 27.

3. ————— Plockiego. 1784. Size, 21 inches by 31.

4. ————— Rawskiego. 1792. Size, 26 inches by 23.

5. ————— Sandomierskiego. 1791. Size, 36 inches by 40.

Scale of each, 3' to 1 inch.

PERTHES, DE.—Carte Hydrographique de Pologne, présentée au feu Roi Stanislas Auguste (en 1784), par Mr. le Colonel de Perthes, &c. Paris, 1809. Size, 26 inches by 32; scale, 45' to 1 inch. (2 copies.)

ZANNONI.—Wizerunek Powszechny Polski y Litwy, &c. Index to Map of Poland and Lithuania, in 24 sheets, by Rizzi Zannoni. 1772. On 1 sheet. Size, 14 inches by 22.

Neueste Karte von Polen und Litauen samt den Oesterreichischen, Russischen und Preussischen Antheile und den Übrigen Angränzenden Ländern. Vienna, 1795. Size, 20 inches by 29; scale, 30' to 1 inch.



*Poland—*

Polen, Litauen, und Kurland im Jahr 1796. Size, 18 inches by 20; scale, 33' to 1 inch.

Polens umgrändelungen von 1772-1809. (2 sheets.) Erste Charte: Polens Auflösung durch dreyimalige Theilung. 1773-1796. Zweyte Charte: Entstehung und Vergrößerung des Herzogthums Warschau. 1807-1810. Size of each, 22 inches by 25; scale, 27' to 1 inch.

SAINT-CYR.—Plan de Polotsk et ses Environs, &c. Sous les ordres du Général Gourion de St. Cyr. (From Saint-Cyr's Atlas Militaire, plate 14.) Size, 18 inches by 32; scale, 1:17280.

*Riga—*

SCHMIDT.—Tabula Geographica Gubernii Rigensis in suos circulos divisi. Auctore J. F. Schmidio. 1772. Size, 19 inches by 24; scale, 10' to 1 inch.

*St. Petersburg, &c., Government of—*

SCHMIDT.—КАРТА САНКТПЕТЕРБУРГСКОЙ ГУБЕРНИИ, &c. Map of the Governments of St. Petersburg, lugermanland, Novogorod, and Viborg, by J. P. Schmidt. 1770. Size, 19 inches by 24; scale, 5' to 1 inch.

*St. Petersburg, City and Environs—*

IMP. MAP DEPÔT.—ТОПОГ. КАРТА ОКРУЖНОСТИ САНКТПЕТЕРБУРГА, &c. Topographical Map of the Environs of St. Petersburg. Imperial Map Depôt, 1817. The 8 western sheets, in 2 parts, and the Title, unmounted, in addition; the remainder is wanting. Size of each sheet, 13 inches by 12; scale, 1 verst to 1 inch.

ЧАСТЬ, &c. Part of the Semitopographical Map of the Environs of St. Petersburg (extending to Viborg). Size, 30 inches by 25; scale, 6 versts to 1 inch.

Plan de la Ville de St. Pétersbourg. Weimar, 1802. Size, 15 inches by 17.

Plan de la Ville de St. Pétersbourg, &c., d'après le plan original Russe, en 9 feuilles, dressée en 1753. Réduit, &c., en 1759. Paris, 1809. Size 24 inches by 36.

ПЛАНЪ, &c. Plan of the Manœuvring Ground between Peterhof and Bronnow. Size, 20 inches by 33; scale, 2 inches to 1 verst.

GERMANY.

GENERAL MAPS.

BAHR.—Die Heilquellen Deutschlands und der Schweiz. Von Dr. Bahr. Berlin, 1844. Size, 20 inches by 17; scale, 1° to 1 inch.

CAUCHARD.—Reduced Map of the Empire of Germany, Holland, the Netherlands, Switzerland, the Grisons, Italy, Sicily, Corsica, and Sardinia. By Captain Cauchard, &c. London, 1800. Size, 54 inches by 33; scale, 20' to 1 inch.

CHAMPION.—Carte de l'Allemagne (River Systems). J. N. Champion, sc. Size, 8 inches by 10.

COULON.—Militair Karte von Sud Deutschland in 20 Sectionen, &c. Von Haupt. A. von Coulon. Munich, 1817. Size of each sheet, 12 inches by 18; scale, 5' to 1 inch.

COVENS ET MORTIER.—Nouvelle Carte de l'Empire divisé selon ses différents Etats: avec des Tables pour trouver facilement les Etats de chaque Prince, &c. Size, 20 inches by 26; scale, 24' to 1 inch.

ENGELHARDT.—Karte vom Preussischen Staate mit den Bundes-Staaten in Nord Deutschland. Halle, 1822. Als zweiter Theil, Karte von Sud Deutschland mit den angränzenden Staaten, &c. Halle, 1826. Von F. B. Engelhardt. 2 sheets; size of each, 19 inches by 25; scale, 1:2,400,000.

- GROSS.—Orbis in Tabula, pars secunda. Zweyter Theil der Geographischen Universal Chartre vorstellend auf einem einzigen Blatt alle Crayse, Provinzen und Vornachste Orte des H. Römischen Reichs, Teutscher Nation, &c. Von J. G. Gross. Nuremberg, . Size, 20 inches by 23.
- GÜSEFELD.—Post Chartre von Teutschland. Von F. L. Güsefeld. Weimar, 1802. Size, 25 inches by 32; scale, 12' to 1 inch.
- Chartre über die Entschädigungen der durch Abtretung des linken Rheinufers an Frankreich, &c., nach dem Entschädigungsplan v. 8 October, 1802 Von F. L. Güsefeld. Nürnberg, 1803. Size, 24 inches by 20; scale, 20' to 1 inch.
- Interims Chartre von Teutschland nach dem Frieden zu Tilsit am 9 July, 1807, bis zu endlicher Bestimmung, &c., zu Ende des Sept. 1807. Von F. L. Güsefeld. Weimar, 1807. Size, 19 inches by 21; scale, 33' to 1 inch.
- HARZHEIM.—Mappa Chorographica omnium Episcopatum Germaniæ ab A.C. MD. ad MDCLX. existentium. II. Episcopatum ante primam millenarium qui vel desierunt vel in alia loca aut nomina transierunt. III. Locorum omnium ubi Concilia Germaniæ habita fuere nomina et sedes. \* \* \* à Josepho Harzheim, & I. Nuremberg, 1762. Size, 20 inches by 23; scale, 35' to 1 inch.
- HIRSCHEL.—Carte Hydrographique et Physique de l'Allemagne, comprenant la Suisse, la Hollande, une partie de l'Italie, de l'Angleterre, et presque toute la France. Par Hirschel. Leipzig, 1803. On 30 sheets, mounted together; size, 46 inches by 54; scale, 15' to 1 inch.
- HOMANN.—Tabula Geographica totius Germaniæ qua differentium imperii trium religionum status et dominia diversis coloribus distincta exhibentur, à Joh. Bapt. Homanno. Size, 20 inches by 23; scale, 33' to 1 inch.
- KIEPERT.—Nationalitäts Karte von Deutschland. Von H. Kiepert. Weimar, 1848. Size, 17 inches by 15; scale, 50' to 1 inch.
- KIESER.—Das nordwestliche Deutschland, oder Generalblatt zu der vom G. M. v. Lecoq in 22 Bl. herausgegebenen gr. Karte von Westphalen. Von C. F. Kieser. Berlin, 1815. Size, 30 inches by 22; scale, 7' to 1 inch.
- MAYER, TOB.—Carte Critique de l'Allemagne, faite suivant un nouveau Desssein appuyé des monumens authentiques du tems ancien et nouveau, avec une comparaison de celui de Mr. de l'Isle et de Homann. Dressée par M. Tob. Mayer. Nuremberg, 1750. Size, 20 inches by 23; scale, 35' to 1 inch.
- NEUGEBAUER.—Fluss und Höhen Skizze von Deutschland und einigen angrenzenden Ländern. Von J. G. Neugebauer. Mayence, 1838. Size, 24 inches by 30; scale, 23' to 1 inch.
- REICHARD.—Das Teutsche Reich in seine Bundesstaaten eingetheilt. Von C. G. Reichard. Nuremberg, 1818. Size, 24 inches by 29; scale, 27' to 1 inch.
- SCHMIDT.—Gebirgs und Gewässer Chartre von Deutschland und den angränzenden Ländern. Von J. M. F. Schmidt. Berlin, 1820. Size, 22 inches by 28; scale, 45' to 1 inch.
- STEPHANI.—Oro-Hydrographische Karte von Deutschland und den Alpen. Von A. A. F. von Stephani (zu v. Roon's Leitfaden). Berlin. Size, 26 inches by 23; scale, 30' to 1 inch.
- STIELER.—Karte von Deutschland, dem Königr. der Niederlande, dem Kgr. Belgien, der Schweiz, und den angränzenden Ländern, bis Paris, Lyon, Turin, Mailand, Venedig, Ofen, Königsberg, in XXV. Blättern. Von A. Stieler, &c. Gotha, 1847. Scale, 2' to 1 inch, or 1:800,000.
- STREIT.—General Chartre von Teutschland in vier Blättern, welche als Übersichts-Tableau der grossen Chartre in 204 Blättern, &c. Von F. W. Streit. Weimar, 1810. Size 46 inches by 40; scale, 12' to 1 inch.
- WEIMAR INST.—Orographische Uebersicht von Teutschland zu Behufe der Topographisch-militairischen Chartre; in 204 Blättern davon. Weimar, 1807. 1 sheet; size, 18 inches by 17. Two copies.



**WEIMAR INST.**—Militairgeographische Uebersicht von Teutschland zu Behufe der Erläuterung des Elementar-Lehrbuches der Militairgeographie. Weimar, 1821.

**WEILAND.**—Fluss Charte oder Vergleichende Uebersicht der Laenge der Haupt-Flüsse von Teutschland. Von C. F. Weiland. Weimar, 1821. Size, 23 inches by 21.

**WEIMAR INST.**—Heilquellen Charte oder die Brunnen und Baeder, &c. Deutschland's, der Schweiz, und der Niederlande. Weimar, 1830. Size, 23 inches by 22; scale, 35' to 1 inch.

**Nuova Carta della Guerra** concernente le distanze d'una Città all'altra, il corso della Reno, e quello dell'Oder. Milano, 1814. Size, 17 inches by 22; scale, 30' to 1 inch.

## AUSTRIAN EMPIRE.

### GENERAL MAPS.

**BLUM.**—Natur und Kunst Producten Atlas der Oesterreichischen Deutschen Staaten. Von H. W. von Blum und Frh. von Kempen. Vienna, 1796. 13 Maps and letterpress, in a cover.

**FALLOX.**—Das Oesterreichische-Kaiserthum; auf Befehl des Fürsten zu Schwarzenberg unter Obersten Fallon. Vienna, 1822. On 9 sheets, in 3 parts; size of each part, 51 inches by 24; scale, 12' to 1 inch, or 1:864,000.

**KIPFERLING.**—Allgemeine Charte der Österreichischen Monarchie. Österreichischer Atlas, No. 1. Gezeichnet von K. J. Kipferling. Vienna, 1803. Size, 19 inches by 23; scale, 37' to 1 inch.

**LE MAIRE.**—Carte hydrographique et de Poste, sur la circulation intérieure du commerce, dans les Etats de S. M. I. Empereur d'Autriche. Par Le Maire, corrigée et augmentée par J. Bauer. Vienna, 1808. Size, 42 inches by 62; scale, 13' to 1 inch.

— Another copy. 1809.

**PETER.**—General Post und Strassen Charte des Oesterreichischen Kaiser Staates, &c. Von J. A. Peter, &c. 1819, Vienna. Size, 25 inches by 44; scale, 20' to 1 inch.

**SPAETH.**—General Charte von den Kaiserlich-Oestreichischen Erb-Staaten nach dem Lüneviller Friedensschluss, &c., neu entworfen u. im Jahr 1804 gezeichnet von Johann Leonhard Spaeth, r.p.o. Nuremberg, 1805. Size, 22 inches by 29; scale, 26' to 1 inch.

**BILDLICH STATISTIK.**—General Karte der Oesterreichischen Monarchie.

I. Uebersicht der relativen Bevölkerung der Oesterreichischen Monarchie. Vienna, 1848.

II. Verhältnisse der Stände zur Bevölkerung in den Provinzen der Oesterreichischen Monarchie. 1843.

III. Uebersicht der landwirthschaftlich benützten Bodenfläche in der Oesterreichischen Monarchie. 1843. On 3 sheets; size of each, 18 inches by 28.

### DIVISIONS OF THE AUSTRIAN EMPIRE.

#### AUSTRIAN GRAND DUCHIES ABOVE AND BELOW THE ENNS.

**AUSTRIAN STAAT.**—Karte des Erz-Herzogthums Oesterreich ob und unter der Enns, &c. Von dem K. K. Oesterreichischen G. Q. Stabe. 1813. On 30 sheets; size of each, 13 inches by 18; scale, 2' to 1 inch.

**GREIPEL.**—Karte des Erzherzogthums Oesterreich ob der Enns. Von E. von Greipel, k.k. Major. Vienna, 1816. Size, 40 inches by 44; scale 2 $\frac{1}{2}$ ' to 1 inch.



- SCHUTZ AND MÜLLER.**—Mappa von dem Land ob der Enns so auf allerhöchsten befehl Sa. Roemisch K. K. Apos. Mayestaet. Joseph II. in dem Jahre 1781. reducirt und in Kupfer gestochen von C. Schutz und geschrieben von F. Müller. 1787. In two parts; size, 75 inches by 86.

*Vienna*—

- LICHTENSTERN.**—Wien's umgebungen. Von M. von Lichtenstern. Vienna, 1809. Size, 22 inches by 22; scale, 3' to 1 inch.
- Grundriss der K. K. Haupt und Residenzstadt Wien, samt ihren Vorstädten.** Vienna, 1821. Size, 48 inches by 40; scale, 85 klafter to 1 inch.
- Neuester Plan der Haupt u. Residenzstadt Wien, &c.** Vienna, 1819. Size, 24 inches by 30; scale, 45 klafter to 1 inch.

BOHEMIA.

- BOCK AND POLACK.**—Tot'us regni Bohemæ Mappa chorographica mineralogico-hydraulico-commercialis, cum comitatu Glacensi et districtu Egerano, &c. Per Bock et Polack. Vienna, 1808. On 4 sheets; size of each, 21 inches by 24.

\*.\* One set, in 4 parts, wants the N.E. sheet; 1 set, in 2 parts, wants the North, except N.W. sheet, unmounted.

- CARY.**—A new Map of Bohemia and Moravia, &c. By John Cary. London, 1819. Size, 20 inches by 22; scale 12' to 1 inch.

- HOMANN'S HEIRS.**—Charte vom Königreich Böhme nach der grossen Müllerschen Charte. Von Homann's Erben. Nuremberg, 1805. Size, 20 inches by 23; scale, 10' to 1 inch.

- KREYBICH.**—Charte des nordlichen Theils von dem Königreiche Böhmen welcher die zur Leitmeritzer Bischoeflichen Diocces gehörigen Kreise nebst den angrenzenden Theilen bis zur Hauptstadt Prag enthaelt in IX Blättern. Von F. J. H. Kreybich. Prague, 1833.

- SCHMETTAU.**—Topographische und Militairische Carte desienigen Theils von Bochemen welcher zwischen Hohenelbe Pless und der Schlesischen grenztze gelegen ist, nebst denen Laagern von der campagne 1778 dem Preussischen Militair zugeeignet durch den Grafen von Schmettau, &c. 1789. In 2 parts; size, 39 inches by 58; scale, 1½ inch to 1'.

- SCHWAB AND STEGMAYER.**—Karte des Kon. Boehmen in deutsch und böhmischen Sprache, &c. Von J. Schwab und M. Stegmeyer. 1799. Size, 20 inches by 26; scale, 10' to 1 inch.

*Carlsbad*—

- HOMANN'S HEIRS.**—Grundriss und Prospect des Welt-berühmter Carlsbad, mit unterschiedlichen Gegenden accurat gezeichnet und ausgefertigt von Homannischen Erben. Anno 1733. Size, 20 inches by 23.

*Prague*—

- Die Umgebungen von Prag.** Size, 12 inches by 15; scale, 3' to 1 inch.

CROATIA.

- STREIT.**—Charte von dem Königreich Kroatien, &c. Von F. W. von Streit. Vienna, 1808. Size, 20 inches by 24; scale, 7' to 1 inch.

GALICIA.

- LOSY DE LOSENAN.**—General Charte des Atlases von Galizien und Lodomerien, &c. Par Mr. L. Ch. Losy de Losenan. Size, 24 inches by 34; scale, 12' to 1 inch.

- SCHINDLER.**—Karte zum Beschürfungs Plan von Ost Galizien gezeichnet nach der Liegungsnischen Karte und der Angabe des K. K. Domainen und Salinen Administrations Assessors Ritter von Schindler, &c. Size, 18 inches by 18.

HUNGARY.

**ARTARIA.**—Uj Posta Mappája Magyar és Erdély Országoknak, &c. Neuße Postkarte von Ungarn und Siebenbürgen, &c. Bei Artaria and Co., Vienna, 1813. Size, 15 inches by 20; scale, 24' to 1 inch.

**KRIEGER.**—Regni Hungariæ, &c. a S. Krieger, &c. Vienna. Size, 19 inches by 28; scale, 20' to 1 inch.

**LIPSKY.**—Mappa generalis Regni Hungariæ partiumque adnexarum Croatia, Slavoniæ, et Confinorum Militarum magni item Principatus Transylvaniæ, &c. Per J. de Lipsky, &c. Pesth, 1806. On 12 sheets. Scale, 64' to 1 inch. Accompanied by an Index of Names in 1 vol. 4to.

**LIPSKY.**—Tabula generalis Regni Hungariæ, Croatia, et Slavoniæ, necnon Magni Principatus Transylvaniæ, conspectum Mappæ generalis, in ix sectiones, &c. per Joannem Lipsky de Sædlicsna. Pesth, 1810. Size, 23 inches by 30; scale, 20' to 1 inch.

“\* This map is an index to Lipsky's large map in 12 sheets.

**MANNERT.**—Charte von Ungarn und Siebenbürgen, Croatien, Slavonien, Dalmatien, Galicien, und Lodomerien den Oesterreichischen Besitzungen in ehemal Polen, nebst vielen angränzenden Ländern der Turkey, &c. Von C. Mannert. Nuremberg, 1803.

**MÜLLER.**—Mappa Geographica novissima Regni Hungariæ divisi in suos comitatus cum Districtibus Jazygum et Cumanorum, Banatus Temesiensis ejusque Districtuum necnon Regnorum Croatia, Slavoniæ, Dalmatiæ, Magni Principatus Transylvaniæ, partis Bosniæ, Servici, Bulgariæ, et Walachiæ, &c. 1769. Ab Ign. Müller. Vienna. On 12 sheets. Sheet 3 wanting. scale, 5' to 1 inch.

—, another copy, complete.

**ROOST.**—Karte von Ungarn und Siebenbürgen nebst Theilen der angrenzenden Länder. Von J. B. Roost. Munich, 1830. Size, 18 inches by 22; scale, 28' to 1 inch.

DIVISIONS OF HUNGARY.

*Banat—*

**RIEDL.**—Karte von dem Banat Temeswar und einigen Districten auf Servischer seite, &c. Von C. Riedl. Munich, 1789. Size, 24 inches by 21; scale, 6' to 1 inch.

**Le Banat de Temeschwar d'après les nouvelles indications, pour servir de renseignement à la Carte des Limites des trois Empires, ou Théâtre de la Guerre présente, 1789.** Size, 18 inches by 24.

*Eisenburg County—*

**KENEDICS.**—Comitatus Castri Ferrei jussu ordine ichnographiæ delineatus, per Jos. Kenedics. Size, 36 inches by 39; scale, 14' to 1 inch.

*Transylvania—*

**WENZELY.**—General Karte von Siebenbürgen, &c. Von A. von Wenzely. Vienna, 1806. Size, 28 inches by 45; scale, 6' to 1 inch.

ILLYRIA.

**GERINI.**—Carta corografica della Divisione Ecclesiastica, Politica, e Finanziaria dell' I. R. Littorale Austro-Illirico, &c. da Giovanni Gerini, 1847. On 6 sheets. Size of each, 24 inches by 19; scale, 1 : 115,200.

INNER AUSTRIA.

**DE CASTRO.**—Carte von Inner Oesterreich, &c. Von Joseph de Castro. Vienna, 1812. Size, 48 inches by 50; scale, 4' to 1 inch.

**HAUSLAB.**—General Karte des Herzogthums Steyermark. By General Hauslab. 1848. Outline and Hills, without writing. Unfinished proof.

- \* **KINDERMAN.**—Die Provinz Inner-Oesterreich oder die Herzogthümer Steyermark, Kranten, und Krain, die Grafschaften Görz und Gradisca, und das Deutsch-Oesterreichische litorale. Von Jos. Karl Kinderman. Vienna, 1794. On 12 sheets, with a special title on each. Size of each, 20 inches by 24; scale of general map, 10' to 1 inch; scale of special maps, 3½' to 1 inch.
- 
- The same. General map only. 1 sheet coloured.

LOMBARDO-VENETIAN KINGDOM.

**AUSTRIAN STAFF.**—Carta topografica del regno Lombardo-Veneto, &c. Dell' I. R. Stato Mag.-Gen. Austriaco. 1833. On 42 sheets. Size of each, 19 inches by 29; scale, 1:86,400, or ⅔ inch to 1'.

**FRENCH GOVERNMENT.**—Carta delle Stazioni Militari, Navigazione, e Poste del Regno d' Italia, seguita nel Deposito Generale della Guerra, &c. 1808-1810. On 4 sheets. Size, 40 inches by 54; scale, 7' to 1 inch, or 1:500,000. (2 copies.)

**PINETTI.**—Carta topografica del Regno Lombardo-Veneto con il Parmigiano, Genovesato, e Toscana sino a Firenze con parte dei paesi confinanti del Piemonte, Svizzera, Grigioni, Tirolo, Carintia e Istria, &c. Dissegnata da G. A. F. Pinetti, &c. Vienna, 1820. On 9 sheets. Size of each, 19 inches by 27; scale, 4' to 1 inch.

**ROUVRE, R. DE.**—Carta del Dipartimento dell' Adige e di una parte dei Dipartimenti Limitrofi. Disegnata ed incisa da F. Richard de Rouvre. Verona, 1812. Size, 41 inches by 31; scale, 1½' to 1 inch. (2 copies.)

DIVISIONS OF THE AUSTRIAN LOMBARDO-VENETIAN KINGDOM.

*Bacchiglione—*

Carta del Dipartimento del Bacchiglione. Size, 23 inches by 26; scale, 2' to 1 inch.

*Brenta—*

Corso generale delle acque tra Verona i monti, l'Adige, ed il Mare dell' ingegner in Capo Sanfermo con la regolare divisione dei Compensorj nel Dipartimento Brenta e terreni limitrofi. Tav. 1. Size, 17 inches by 24.

*Milan, Province—*

**PARA.**—Carta topografica delle provincie di Milano e di Pavia, coll' indicazione delle nuove Strade e Canali, diretta dall' Ispettore Gen. Carlo Para. Size, 39 inches by 34; scale, 1¼ inch to 2'.

*Milan, City—*

**AUSTRIAN STAFF.**—Contorni di Milano. Nell' Istituto geografico di Milano dell' I. R. Stato Maggiore Generale. On 4 sheets. Size of each, 23 inches by 35; scale, 1½ inch to 1'.

**UMICINI.**—Pianta di Milano (presso li Fratelli Ubicini). Milan. Size, 12 inches by 14.

*Padovano, &c.—*

**VALLE.**—Mappa del Padovano, del Polesine di Rovigo, del Dogado, della parte meridionale del Vicentino, del Trevigiano, e della parte settentrionale del Ferrarese, &c. Da Giovanni Valle. Venice, 1801. Size, 28 inches by 37; scale, 2' to 1 inch.

*Venice, Duchy—*

**OSSENBRUG.**—Charte von dem Oesterreichischen Herzogthume Venedig, &c. Gez. von J. v. Ossenbrug. Vienna, 1804. Size, 19 inches by 23; scale, 8' to 1 inch.

**ZACH.**—Das Herzogthum Venedig, &c. unter der Leitung des Anton Frh. v. Zach. Vienna, 1801-1805. On 4 sheets. Size of each, 19 inches by 25; scale, 3' to 1 inch.



*Venice, Lagoons—*

GRANDIS.—La Veneta Laguna, antica e moderna, novamente delineata e distinta nelle sue Isole, Valli, e Canali, quali si trovano al presente, &c. Alvise Grandis, del. Venezia, 1799. Size, 20 inches by 26; scale  $1\frac{1}{2}$  to 1 inch.

La Veneta Laguna, &c. (Old Map without Title.) Size, 15 inches by 24.

*Venice, City—*

VIERO.—Nuova pianta iconografica dell' inelita Città di Venezia. Appo T. Viero. Venice, 1810. Size, 20 inches by 23.

*Roads in Lombardy—*

DONEGANI.—Carta della Strada Militare da Lecco al Tirolo e della Commerciale di Spluga. C. Donegani, sc. (MS.) Size, 22 inches by 28.

MORAVIA AND SILESIA.

AUSTRIAN STAFF.—Carte des Herzogthum Salzburg von dem K. K. Oesterreichischen G. Q. Stabe in 1806, 1807. On 15 sheets. Size of each, 12 inches by 17; scale, 2' to 1 inch. Also, another copy.—Mounted together; size, 52 inches by 48.

MÜLLER.—Karte des Markgraffthum Mähren. Entworfen nach C. Müller, von I. E. S. Vienna, 1816. Size, 24 inches by 33; scale, 5' to 1 inch.

PASSY.—Machren und Oesterreichisch Schlesien, &c. Entworfen von Christoph von Passy, K. K. Professor der Rechte zu Ollmütz. Vienna, 1810. On 4 sheets. Size of each, 16 inches by 22; scale, 4' to 1 inch.

SALZBURG.

AUSTRIAN STAFF.—General Carte vom Herzogthum Salzburg nach der von dem K. K. G. Q. Staab. 1814. Size, 26 inches by 25; scale, 4' to 1 inch.

\* \* Three copies. The title of one contains a dedication to Alexander I. Emperor of Russia, which has been erased in the later editions.

KIPFERLING.—Charte von Salzburg, Passau, Aichstaedt und Berchtesgaden. Von K. J. Kipferling. Vienna, 1803. Size, 20 inches by 24; scale, 7' to 1 inch.

MALL.—Das Landt und Erz Stifft Berchtolsgaden mit den anstossenden Graentzen. J. Mall, 1628. Size, 26 inches by 34. Engraved on wood.

TYROL, ETC.

ANICH AND HUEBER.—Tyrolis sub felici regimine Marie Theresie R. Imp. Aug. chorographice delineata a Petro Anich et Blasio Hueber. Colonis oberperfusionis, curante Ignat. Weinhart, Profess. Math. &c. Vienna, 1774. On 20 sheets, mounted in 4 parts. Size of each part, 45 inches by 45; scale,  $1\frac{1}{2}$  to 1 inch. Also, an Index Map to the above, entitled "Atlas Tyrolensis." Size, 24 inches by 20.

— Carte topographique du Tyrol, en vi feuilles, réduite d'après la grande Carte d'Anich et de Huber en xx feuilles, rectifiées sur les Observations de plusieurs Officiers Français, &c. Basle. Size, 45 inches by 43; scale, 3' to 1 inch.

— Carte von Tyrol, nach Peter Anich, &c. &c. und neuern Hülfquellen verfasst von J. E. S. Vienna, 1809. Size, 35 inches by 35; scale, 4' to 1 inch.

AUSTRIAN STAFF.—Karte der Gefürsteten Grafschaft Tyrol nebst Vorarlberg und den angrenzenden Souverainen Fürstenthum Liechtenstein. Red. u. gez. in 1823, von dem K. K. Oes. G. Q. Stabe. On 24 sheets. Size of each, 13 inches by 18; scale 2' to 1 inch.

FRENCH GOVERNMENT.—Carte du Tyrol, vérifiée et corrigée sur les Mémoires de Dupuits et de La Luzerne, et réduite d'après celle d'Anich et Hueber. Publiée en l'An 9, au Dépôt Gén. de la Guerre, et augmentée du Vorarlberg en 1808. On 2 sheets. Size, complete, 70 inches by 83; scale, 2' to 1 inch.

- \* **FRIED.**—General Post und Reise-Karte von Tyrol und Vorarlberg von F. Fried. Vienna, 1839. Size, 32 inches by 23; scale, 7' to 1 inch.
- MAYR.**—Reise Karte von Tyrol und Vorarlberg mit den angränzenden Ländertheilen nach der Special-Karten des K. K. Oesterreichischen General Stabs, &c. Von Gg. Mayr. Munich, 1838. Size, 18 inches by 21; scale, 8' to 1 inch.

#### DIVISIONS OF TYROL.

##### *Arlberg—*

**PFAUNDLER.**—Provincia Arlbergica sequentes Comitatus aliosque Dominatus Austriacos, &c. Secundum chartam à Blasio Hueber, &c. Per J. A. Pfäundler. 1783. Size, 48 inches by 30; scale, 1½' to 1 inch.

##### *Schwtzer Kreis—*

Der Nördlichste Theil Tyrols oder der Schwitzer Kreis nach Peter Anich mit mehreren wesentlichen verbesserungen vom Benedict von Sardagna, &c. 1795. Size, 22 inches by 31; scale 3' to 1 inch.

### BADEN.

#### GENERAL MAPS.

**HEUNISCH.**—Das Grossherzogthum Baden, nach seinen Bestandtheilen Standes und Grundtheschaften Acquisitionen und Cessionen unter zugrundlegung der Major Hanserschen u. Anderer Karten als Historischer Karte, bearbeitet von A. J. V. Heunisch. Karlsruhe, 1819. On 5 sheets, with a statistical table on an extra sheet. Size of each, 29 inches by 20; scale, 6' to 1 inch.

——— Schul- und Producten Charte über das Grossherzogthum Baden. Von A. J. V. Heunisch. Size, 17 inches by 12; scale, 11' to 1 inch.

**TULLA.**—Charte über das Grossherzogthum Baden, &c. Von J. G. Tulla. 1814. Karlsruhe. Size, 26 inches by 16; scale, 7' to 1 inch.

**WILHELMI.**—Kurze Geographie des Grossherzogthums Baden, für das Volk und die Jugend, &c. Von K. Wilhelmi. Karlsruhe, 1838. With a map; stiff covers.

#### PARTS OF BADEN.

##### *Baden Baden City—*

**DELKESKAMP.**—Panorama von Baden Baden und seinen nächsten Umgebungen. Von F. W. Delkeskamp. Frankfurt. Size, 19 inches by 13.

Situations Charte der Gegend von Baden und den Murgthale. Size, 19 inches by 24. (2 copies.)

##### *Brisingau—*

**SEUTTER.**—Accurata delineatio Brisgovie cum civitatibus silvestribus Austrie Anterioris, tanquam Limitum et Terminorum Imperii Rom. Germanici versus Occasum. Cura et impensis Matthæi Seutteri, S. C. M., Geogr. Augusta Vindel. (Augsburg.) Size, 23 inches by 20; scale, 3½' to 1 inch.

##### *Pfenz and Enz Circle—*

**DER PFENZ und ENZ Kreis im Grossherzogthum Baden.** Karlsruhe, 1813. Size, 12 inches by 14.

### BAVARIA.

#### GENERAL MAPS.

**APIAN.**—Corographia Bavariae. Beschreibung des Landes und Fürstenthums Oberrn und Niderrn Baiern samdt den umbligenden anstossen anderer herschaften dar innen die Stet, Marekt, Closter, Schlosser, auch otlich Dorffer, Geburg, Waldt, Wasserfluss, See, Weyer, und anders auf das vleissigst verzeichnet seyen. Durch Philippum Apianum. Ingolstadt, 1568. On 24 sheets; size of each, 15 inches by 18; scale, 2' to 1 inch.



**BAVARIAN TOPOG. BUREAU.**—Topographischen Atlas vom Königreich Bayern. On 112 sheets. Size of each, 22 inches by 34; scale,  $1\frac{1}{2}$  inch to 1' (2 copies of sheet 110). See Atlases.

Uebersichts Karte zur zusammensetzung des Topographischen Atlas vom Königreiche Bayern diesseits Rhein, nach dem entwurfe vom Jahre 1818. Size, 18 inches by 20; scale,  $4\frac{1}{2}$  inches to 1".

Uebersicht des Topographischen Atlases vom Königreich Bayern. 1843. Size, 22 inches by 34; scale,  $1\frac{1}{2}$  inches to 15'.

Hauptdreiecknetz zum Topographischen Atlas des Königreichs Bayern mit angabe der ersten Mathematischen Grundlage zur Construction desselber. Herausgegeben von dem Topographischen Bureau des Königl. Bayer General-quartiermeisterstabs im Jahre 1831. Size, 22 inches by 34; scale,  $5\frac{1}{2}$  inches to 1".

**BAVARIAN GOVERNMENT.**—Instruction für die allgemeine Landes-Vermessung zum Vollzuge des Grundsteuer-Gesetzes. 4to. 1830. With 17 maps and tables.

Uebersichts-Karte der Neusten Eintheilung des Königreichs Bayern nach der allerhöchsten Verordnung vom 29 Nov., 1837. Munich, 1838. Size, 20 inches by 20.

Karte von Oberbayern nach den Vermessungen der K. B. Steuer-Kataster-Comission, etc. Munich, 1838. Size, 27 inches by 30; scale, 1' to 1 inch.

**BUNA.**—Exactissima Statuum totius Ducatus Bavariae, etc. Le Duché de Bavière, divisé en neuf cartes géographiques très exactes, nouvellement et régulièrement dressés, contenant non seulement les Etats, Seigneuries et Bailliages qu'il contient, mais aussi celles qui y confluent. Par le Sr. Buna. Frankfurt. Size of each sheet, 23 inches by 21; scale, 2' to 1 inch.

**DIRWALD.**—Das Königreich Baiern nebst den angrenzenden Ländern nach Finck und Riedl, etc. Von Joseph Dirwald. Vienna, 1813. Size, 45 inches by 44; scale, 6' to 1 inch.

**FEMBO.**—Die Königreiche Baiern und Württemberg das Grossherzogthum Baden und das Fürstenthum Hohenzollern. Von C. Fembo. Nuremberg, 1823. Size, 20 inches by 23; scale, 12' to 1 inch.

**HANSER.**—Ober Bayern des Königreichs Bayern mit der Eintheilung in Land- und Herrschafts Gerichte. Von A. Hanser. Nuremberg. Size, 27 inches by 28; scale, 33' to 1 inch.

**KREYBICH.**—Charte von dem Nordwestlichen Theile des Königreichs Bayern dem Grossherzogthume Würzburg, dem Fürstenthume Aschaffenburg, &c. oder der Mayn. Entworfen von F. H. Kreybich, etc. Weimar, 1807. (Interims Charte vom Frieden von Tilsit den 9 July, 1807, bis zum allgemeinen Frieden von Europa.) Size, 19 inches by 22; scale, 8' to 1 inch.

**HOMANN.**—Bavariae pars superior tam in sua regimina principaliora quam in eorundem praefecturas particulares accurate divisa. Exeudente Joh. Baptista Homanno. Nuremberg. (La haute Bavière, divisée en deux grandes Régences, etc.) Size, 23 inches by 20; scale, 5' to 1 inch.

**MAYR.**—Specielle Reise-Karte vom Bayerischen Hochland, Nord-Tyrol, Salzburg, und Salzkammergut. Mit einer Vergleichenden Höhendarstellung nach den neuesten amtlichen Vermessungen entworfen, gezeichnet, gestochen, und herausgegeben von Gg. Mayr. 1841. Munich. Size, 15 inches by 28; scale, 1:500,000, or 7' to 1 inch.

**RHEINHARD.**—Bavaria. Bei Carl Rheinhard. Munich. (Unfinished proof, no title, &c.) Size, 17 inches by 22; scale, 14' to 1 inch.

**RIEDL.**—Zu Oberst v. Riedl's Stromatlas von Bayern:—No. 1, Plan des Würm Sees; 5, Walchen See, Kochel See; 6, Der Bartholomä oder Königs See; 7, Der Waginger See; 8, Der Staffell See, Der Rieg See; 13, Der Boden See; Der Sims See; Der Eyb See. *Imperfect.*



SEUTTER.—Bavariae pars superior designatis Confinibus etiam Provinciis, non solum juxta ditiones Generales, sed etiam Praefecturas Speciales accuratissime distincta. Cura et impensis Matthaei Seutteri. Size, 23 inches by 20; scale, 5' to 1 inch.

SPRUNGEL.—Das Königreich Bayern, 1841. Von Sprunger. Bamberg. Size, 10 inches by 12; scale, 26' to 1 inch.

VOLKERT.—Statistische Karte vom Königreiche Bayern zugleich übersichts und post Karte von Südwest Deutschland. Von August Volkert. Munich, 1840. Size, 27 inches by 40; scale, 1: 600,000, or 8' to 1 inch.

Bavariae pars superior tam in sua regimina, &c. La Haute Bavière selon sa division actuelle, en y comprenant les nouvelles acquisitions faites l'an 1802. Nuremberg. Size, 23 inches by 20; scale, 5' to 1 inch.

Bavariae pars inferior \* \* \*. La Basse Bavière, selon sa division actuelle, et avec les nouvelles acquisitions faites l'an 1802. Nuremberg. Size, 20 inches by 23; scale, 4' to 1 inch.

Gränz Karte des Königreichs Baiern mit Einschlusse des Rheinkreises. 1825. Munich. Size, 20 inches by 25.

#### PARTS OF BAVARIA.

##### *Bairuth—*

CNOFF AND LONGOLIUS.—Principatus Brandenburgico-Calmbacensis vel Baruthinus tabula geographica quoad partem superiorem expressus. Delineata a Matthaeo Ferd. Cnopf et emendata de Paulo Daniel Longolio. Nuremberg. Size, 20 inches by 23. Two copies.

##### *Bamberg—*

HOMANN.—Sac. Rom. Imperii Principatus et Episcopatus Bambergensis, nova tabula geographica in qua non solum omnes ejusdem Toparchiae Officia et Praefecturae proximae et remotae, sed etiam Dominatus Carinthiaci \* \* \*. A Jo. Bapt. Homanno, S. C. M. Geog. Nuremberg. Size, 20 inches by 23; scale, 34' to 1 inch. Two copies.

##### *Eichstädt—*

HOMANN.—S. R. I. Principatus et Episcopatus Eistettensis cum omnibus suis praefecturis, &c. A J. B. Homanno, &c. Nuremberg. Size, 20 inches by 23; scale, 2' to 1 inch.

##### *Franconia—*

HOMANN.—Circuli Franconiae pars orientalis et potior \* \* \*. Jo. Bapt. Homann. Nuremberg. Size, 23 inches by 20; scale, 6' to 1 inch.

— Circuli Franconiae pars occidentalis, exhibens simul integrum ferè Electoratum Moguntinum \* \* \*. Jo. Bapt. Homann. Nuremberg. Size, 23 inches by 20; scale, 6' to 1 inch.

##### *Kissingen—*

BAV. TOPOG. BUREAU.—Kissingen mit seiner Umgegend. Herausgegeben vom Topog. Bureau des K. B. Generalquartiermeisterstabs, 1841. Size, 22 inches by 16; scale, 1: 25,000.

##### *Mayn, Lower—*

HAMMER.—Der Unter-Mayn-Kreis des Königreichs Baiern mit der Eintheilung in Land und Herrschafts-Gerichte. Von C. F. Hammer. Nuremberg, 1829. Size, 22 inches by 26; scale, 4' to 1 inch.

##### *Munich—*

MAYR.—Plan der Königl. Haupt und Residenz-Stadt München, nebst ansichten Merkwürdiger gebäude. Von Gg. Mayr. 1841. Munich. Size, 14 inches by 14. With sketches.

*Palatinates—*

HOMANN.—*Palatinatus Bavarie, vulgo die Obere Pfaltz, in omnes ejusdem status et præfecturas accurate divisus. Auctore Joh. Baptista Homanno.*—Haut Palatinat, ou la partie Septentrionale du Cercle de Bavière. Nuremberg, Size, 20 inches by 23; scale, 4' to 1 inch.

MAYER.\*—*Charta Palatina jussu et auspiciis Seren. ac Potent. Elect. Palatini \* \*.* Producta a Christiano Mayer, Aulæ Pal. Astronomo. Size, 27 inches by 28.

*Rhine Provinces—*

Charte von Rheinbayern nebst den Rhein-Provinzen von Sachsen-Coburg-Saalfeld, Hessen-Homburg und angränzenden Ländern. Carlsruhe, 1817. Size, 16 inches by 18; scale,

*Rhoen Mts.—*

JÄGER.—Das Hohe Rhoengebirg in Franken. Von F. A. Jäger. 1802. Erfurt, Size, 22 inches by 16.

GÜSEFELD.—Charte von dem Rhoengebirge mit den anliegenden Orten aufgenommen von Georg Schrenk. Von F. L. Güsefeld. Size, 8 inches by 10.

*Werdenfels—*

COULON.—Durchschnitt der Grasschaft Werdenfels. Entworfen von A. von Coulon. Size, 10 inches by 15.

*Zweybrücken (Deux Ponts)—*

FRITSCH.—Geometrische Karte über das ober Amt Zweybrücken nebst dem dazu gehoerigen Amte Homburg. Von J. T. Fritsch, &c. 1794. Berlin. Size, 21 inches by 24.

## BRUNSWICK.

HENNEMANN.—Plan de la levée du siège de Brunswic la nuit du 13 au 14 d'Octobre, 1761. Delin. J. C. Hennemann. The Hague, 1763. Size, 20 inches by 24.

## FRANKFORT.

STREIT.—Charte von dem Grossherzogthume Frankfurt und den Fürstlich Isenburgischen Landern, &c. Von F. W. Streit. Weimar, 1811. Size, 25 inches by 20; scale, 3½' to 1 inch.

## HANOVER.

### GENERAL MAPS.

HOGREWE.—Carte géographique des pays situés entre l'Elbe et le Weser comme aussi entre le Trave et la Hunte, et particulièrement de l'ancien pays de Hanovre et de Bransvic d'après le partage actuel entre l'Empire François et le Royaume Westphalie, contenant les Départements François des Bouches de l'Elbe, &c. Par J. L. Hogrewe et J. F. Heiliger. 1812. Size, 60 inches by 50; scale, 3' to 1 inch.

MÜLLER.—Chorographische Karte des Königreichs Hannover, Grossherzogthums Oldenburg, Herzogthums Braunschweig, der Fürstenthumes Lippe-Deitmold, Schaumburg-Lippe und Pyrmont, der Gebieth der freien Reichstädte Hamburg und Bremen, &c. Von W. Müller. Hanover, 1818. On 20 sheets; size of each, 17 inches by 23; scale, 2' to 1 inch.

— Chorographischer Post Karte des Königreichs Hannover, &c. Von W. Müller. Hanover, 1821. On 9 sheets; size, 32 inches by 56; scale 5½' to 1 inch.

PARTS OF HANOVER.

*Aller E.—*

BAUR.—Plan du Passage de l'Aller et de l'Affaire de Hoya, avec les Mouvements de l'Armée alliée après ce Passage jusqu'à la prise de Nienbourg. F. W. de Baur. The Hague, 1765. Size, 23 inches by 20.

*Bremen, Old Duchy, &c.—*

HOMANN.—Ducatus Bremæ et Ferdæ Nova tabula. Edita a Joh. Bapt. Homanno. Nuremberg, . Size, 20 inches by 23; scale, 5' to 1 inch.

*Friesland, East—*

CAMP.—Neu-Geographische Special Karte von dem Fürstenthum Ost Fries- und dem Harrlingerlande nach geomet. und trig. Vermessungen, &c. Aufgenommen und bearbeitet in den Jahren 1798-1802, durch W. Camp und dessen beiden Gehülfen Bannik und van der Linden. Berlin, 1804. On 2 sheets; size, 32 inches by 38; scale, 1½' to 1 inch.

*Göttingen—*

SEUTTER.—Topographische Entwurf der Königl. Grosbritanische Vestung und Universitäts Stadt Goettingen, &c. Von Matt. Seutter. Size, 22 inches by 24.

Göttinger Ichnographia. (Old, no date, &c.) Size, 9 inches by 14.

*Hanover, City—*

Karte der Cantonirungs Quartiere um Hannover in 1821. Size, 14 inches by 18.

*Hohnstein—*

HOMANN'S HEIRS.—Comitatus Hohnstein, necnon Dynastiarum Lohra et Klettenberg geographica delineatio, &c. Stadio Homannianorum Heredum. 1761. Size, 20 inches by 23; scale, 1¼' to 1 inch.

HESSEN CASSEL.

KELLERMANN.—Charte von Kur-Hessen. Gezeichnet, &c., von C. Fembo, berichtigt von J. L. Kellermann. Nuremberg, 1836. Size, 23 inches by 20; scale, 5' to 1 inch.

*Cassel, City—*

GERLACH.—Plan du Siège de Cassel avec les travaux et les tranchées des Alliés devant cette place, &c., 1762. Levé par H. D. Gerlach, &c. The Hague, 1763. Size, 35 inches by 24.

*Schmalkalden—*

GELBKE.—Die Herrschaft Schmalkalden durch die Constitution im Jahre 1807, zum Königreich Westphalen, und zwar zum Departement der Werra gehörig. Von C. Gelbke. Size, 8 inches by 12.

HESSEN DARMSTADT.

GENERAL STAFF.—Karte von dem Grossherzogthume Hessen in das trigonometrische Netz der allgemeinen Landesvermessung aufgenommen von dem Grossherz Hessischen Generalstabe. Only the Section containing Darmstadt. Size, 21 inches by 21; scale, 1:50,000.

MEISTER.—Chorographische Karte von dem Grossherzogthume Hessen nach dem Staatsvertrage vom 30 Juni 1816. Von G. Meister, &c. Size, 30 inches by 21.

*Odenwald, &c.—*

HAAS.—Special-Karte von dem Odenwald, dem Bauland und einem Theil des Spessart's nebst den angrenzenden Ländern am Rhein und Neckar. Herausgegeben von H. Haas, &c. Darmstadt, 1808. Size, 17 inches by 22; scale, 3' to 1 inch.



LIPPE.

NIEHAUSEN.—Grafschaft Lippe sowohl Schaumburg-Lippische als Lippe-Deitmoldische Antheile. Von C. F. Niehausen. 1786. Size, 22 inches by 26; scale,  $1\frac{1}{2}$ ' to 1 inch.

MECKLENBURG SCHWERIN.

SCHMETTAU.—Topographisch Oeconomisch und Militairische Charte des Herzogthums Mecklenburg Schwerin und des Fürstenthums Ratzeburg, &c. durch den Gr. von Schmettau, &c. 1788. On 16 sheets; size of each, 25 inches by 37; scale,  $1\frac{1}{4}$  inch to 1'.

MECKLENBURG STRELITZ.

GÜSEFELD.—Special Charte von Mecklenburg Strelitz aus der grossen Schmettauschen Charte gezogen, etc. Von F. L. G. Nürnberg, 1797. Size, 23 inches by 20; scale, 2' to 1 inch.

NASSAU.

FEMBO.—Charte von Herzogthum Nassau. Von Chris. Fembo. Nürnberg, 1818. Size, 23 inches by 20; scale, 3' to 1 inch.

HEUNISCH.—Das Herzogthum Nassau in einer Tabelle geographisch statistisch dargestellt von A. J. V. Heunisch. Karlsruhe, 1822. Size, 26 inches by 18.

*Rhine, &c.*—

ULRICH.—Situationskarte von den Rhein, Main, und Lahngegenden. Von C. F. Ulrich; with Explanation. Darmstadt, 1822. Size 19 inches by 24.

*Taunus Mts.*—

STREIT.—Carte du Taunus et ses eaux minérales. Par Dr. F. G. Streit, Wiesbaden, 1835. Size, 17 inches by 22; scale, 1:180,000.

PRUSSIA.

GENERAL MAPS.

BERMANN.—General Karte von Nord-Deutschland oder die Preussische Monarchie, und die angränzenden Staaten. Uebersicht der relativen Bevölkerung der Preussischen Monarchie und der benachbarten (nord deutschen) Staaten. Bei Joseph Bermann. Vienna, 1848. Size, 17 inches by 27; scale, 33' to 1 inch.

CARY.—A new Map of the Kingdom of Prussia, with its divisions into Provinces and Governments. By John Cary. London, 1819. Size, 19 inches by 21; scale, 12' to 1 inch.

ENGELHARDT.—General Karte von Preussischen Staate mit den Gränzen der Regierungs-Bezirke und landrätlichen Kreise; entworfen im Jahre 1827. Von F. B. Engelhardt. Berlin, 1829. Size, 26 inches by 41; scale, 1:1,200,000, or 16' to 1 inch.

GÜSEFELD.—Charte von Süd Preussen. Entworfen von F. L. Gusefeld. Nürnberg, 1794. Size, 20 inches by 23; scale, 10' to 1 inch.

LANGE.—Neue producten und industrie Karte von den Samtlich Königlich Preussischen Staaten welcher die Merkwürdigsten Natur und Kunst Producte vornehmsten Handelsplatze, nebst den aufs neue berechneten Flächen-Inhalt in Deutschen quadrat-meilen enthält. Von F. E. Lange. 1796. Size, 17 inches by 26.

MARE.—Karte vom Preussischen Staat vor und nach dem Tilsitter Frieden, 1807. Berlin. Bey Carl Mare. Size, 11 inches by 14; scale, 1° to 1 inch.

**RAU.**—Hydrographische Karte vom Preussischen Staate und den angrenzenden Ländern Nord Teutschlands von C. Rau. 1826. On 4 sheets; size of each, 16 inches by 24; scale, 14' to 1 inch.—Another copy. 1827.

PARTS OF THE PRUSSIAN STATES.

*Brandenbourg—*

**GÜSEFELD** — Nouvelle Carte géographique du Margraviat (Carte de l'Electorat) de Brandebourg divisée en ses provinces, &c. Par F. L. Güsefeld. 1773. Nuremberg. Size, 20 inches by 23; scale, 8' to 1 inch.

*Henneberg—*

**GLAESER.**—Geographischer Plan der Gefürsteten Graffschaft Henneberg Chur Sächsischen Theils enthält die Aemter Schleusinger Suhl und Kahndorff mit Bennshausen. Von F. G. Glaeser. 1774. Size, 20 inches by 27; scale, 1' to 1 inch.

*Hundsruok, &c.—*

**HARDY.**—Reconnaissance militaire du Hundsruok et dans le pays entre Rhin et Moselle, ou Carte topographique qui comprend le cours de la Basse-Sarre, celui de la Moselle depuis Wasser-bilich jusqu'à son confluent dans le Rhin, le Hobe-Wald, le Sohner-Wald, le Hundsruok, le cours de la Naw, de la Haute-Elise, de la Glann, de la Lantern, de l'Alzeins, de la Selz, et enfin celui du Rhin depuis Mayence jusqu'à Coblenz. Par Général Hardy. An VI., Rép. Fr. Paris, 1798. On 6 sheets; size of each, 18 inches by 29.

*Laacher-See—*

**TARDIEU.**—Carte des Environs du Laacher-See, near Coblenz. Gravé par Tardieu. Size, 7 inches by 9.

*Lausitz—*

**FEMBO.**—Die Lausitz, &c. Von Chris. Fembo. Nuremberg, 1815. Size, 23 inches by 20; scale, 4' to 1 inch.

*Moselle R.—*

**HOELSCHER.**—Panorama de la Moselle et de ses Environs, depuis Trèves jusqu'à Coblencc. (Depuis Coblencc jusqu'à Igel.) Coblencc, 1841. J. Hoelscher. Size, 26 inches by 12.

*Paderborn—*

**CARLET.**—Evêché de Paderborn, &c. Par M. Carlet de la Rozière. 1760. Frankfort. Size, 16 inches by 20; scale, 24' to 1 inch.

*Rhine, Lower—*

**VAN DER MAELEN.**—Carte du Grand Duché du Bas-Rhin et une partie des Etats limitrophes. Brussels, 1832. Size, 22 inches by 24; scale, 8' to 1 inch.

*Rhine, R.—*

**HALESZA.**—Der Rhein von Main bis Köln. Erläuternder Text zum Rhein-Panorama, &c. 8vo. 24 pages. Text only. Mayence.

*Saxony—*

**SPROTTA.**—Silesia inferior, &c. A Jona Sculteto Sprotta-Silesio. Size, 17 inches by 21.

*Uckermark—*

**SOTZMANN.**—Special Karte von der Uckermark mit Genehmigung der Königl. Acad. der Wissenschaften zu Berlin herausgegeben 1796 von D. P. Sotzmann. Size, 21 inches by 23; scale, 24' to 1 inch.

*Weimar Mountains—*

**WEIMAR INST.**—Charte vom Weimargebirge. Weimar, 1807. Size, 10 inches by 8; scale, 12' to 1 inch.

*Westphalia—*

**Le Coq.**—Topographische Karte in XIII blaettern den grösten Theil von Westphalen enthaltend, so wie auch das Herzogthum Westphalen und einen Theil der Hannövrischen, Braunschweigischen und Hessischen Länder, etc. Von Gen. Major von Le Coq. 1805. Size of each sheet, 26 inches by 39; scale, 3' to 2½ inches.

Another copy in sheets. Imperfect. Only Sect. 2, 4, 6, 7, 9, 10, 13, 14, 15, 16, 17, 18, 19, 20, and Index.

*Westphalia, N.—*

**Bawr.**—Plan des Mouvements de l'Armée depuis le 26 jusqu'au 31 de May, de même depuis le 12 Août jusqu'au Sept. 1759. F. W. de Bawr. The Hague, 1766. Size, 23 inches by 36.

PRUSSIAN CITIES AND TOWNS.

*Berlin—*

**BRÜGNER, ETC.**—(Enviroms of Berlin) incomplete, without title, &c. On 14 sheets, mounted, in 3 parts. Size of each sheet, 18 inches by 18; scale, 1:25000 (Metallographie von C. Brügner. Aufgenommen von dem Ing. Geog. Gläser, zum Ausdruck gez. von Materski).

The following are the sections in the collection:—Tremmen, Markau, Rohrbeck, Spandow, Berlin, Gr. Krenz, Ketsin, Fahrland, Teltow, Tempelhoff, Werder, Potsdam, Gütergotz, Lichteaurade.

**FALCKENSTEIN.**—Manöuver plan der Gegend um Berlin, etc. Vom Capitain v. Falckenstein, etc. Berlin, 1831-1841. Size, 36 inches by 38; scale, 1:100000, or 2' to 1½ inch.

*Bonn—*

Karte von Bonn und der Umgegend. Size, 9 inches by 12.

*Coblentz—*

Enviroms of Coblentz (no title). Size, 13 inches by 17.

*Fürstenstein—*

**FALCKENSTEIN.**—Fürstenstein mit seinen nächsten Umgebungen eine topog. Darstellung von der Thalbildung des Hellbaches und des Salzaches vor ihrer Vereinigung zur Palsnitz, etc. Von E. Vogel von Falckenstein und Eugen von Hartwig. Berlin, 1840. Size, 14 inches by 16; scale, 1:10000.

*Heidelberg—*

**LEGER.**—Plan des Schlosses auf dem Jettenbüchel zu Heidelberg von Dr. Leger, etc. Herausgegeben von K. von Graimberg. 1822. Size, 17 inches by 22.

*Minden—*

**Bawr.**—Plan du Siège du Minden. F. W. de Bawr. The Hague, 1766. Size, 22 inches by 29.

**PETERMANN.**—Plan der Gegend bey Minden. Plan XVII. Petermann, sc. Size, 19 inches by 22.

**ROY.**—Plan de la Bataille de Tonhausen près de Minden gagnée le 1 Août, 1759, &c. Par Guil. Roy, Capitaine au service de Sa M. Brit. Size, 24 inches by 27.

*Trier, &c.—*

**FELSING.**—Situations karte von den Teutschen und Französichen Positionen in der Gegend um Trier und Saarburg im Jahr 1793 und 1794. Von C. Felsing, Darmstadt. Size, 25 inches by 24.

REUSS, PRINCIPALITIES OF.

**SCHULZ.**—Delineatio geographica specialis territorii celestimonien S. R. I. Comitum Rathenorum de Plania utriusque linea senioris et junioris partem Vogtlandie. Opera et studio Joh. Gottlieb Schulzii, &c. Vienna. Size, 24 inches by 21; scale, 2' to 1 inch.



## SAXONY.

## GENERAL MAPS.

**BACKENBERG.**—Situations Charte von einem Theile des Churfürstenthums Sachsen der Ober und Nieder Lausitz und Schlesiens, nebst denen Stellungen, Bataillen, und Gefechten die zwischen den kaiserl. kön. und königl. preussischen Arméen, besonders in den letzten Jahren des Siebenjährigen Krieges, in diesen Gegenden vorgefallen sind. Von F. H. Backenberg. Dresden, 1805. On 10 sheets. Size of each, 22 inches by 28; scale, 1' to 1 inch.

**HOMANN'S HEIRS.**—Besondere Land Karte des Herzogth. od. Churkreises Sachsen, &c. Von Homannischen Erben, 1752. Sheets 3 and 4 only. Size of each, 14 inches by 19; scale, 1½' to 1 inch.

**LANGE.**—Neue Karte des Churfürstenthums Sachsen und der incorporirten Lande, welche die merkwürdigsten Kunst und Natur Producte vornehmsten, Handelsplätze, nebst denaussen neue berechneten Flächen-Inhalt nach Quadrat Meilen enthält. Von J. E. Lange. Leipzig, 1750? Size, 16 inches by 26; scale, 13.5' to 1 inch.

**PETRI.**—Gantz neue und vollstaendige geographische General-Charte vom gantzen Churfürstenthum Sachsen mit allen einverleibten dann gehörigen Marggrafthümern, Fürstenthümern, Grafschaften, Stiftern und Herrschaften auch andern fremden angrenzenden Landern. Diese Carte ist angefertigt und gezeichnet in den Jahren, &c. 1759-1763, von dem Kön. Preuss. Ing. Petri. On 15 sheets. Size of each, 23 by 19; scale, 2½' to 1 inch.

**ZOLLMANN.**—Ducatus Saxonie Superioris prout ipsius conditio fuit ab anno 1000 usque ad A. 1400 sive intra Seculum x. et xv. ex historia maxime utatis erutus ac geographice designatus, per Frid. Zollmann, &c. Nuremberg, 1732. Tab. II. Size, 20 inches by 23.

ut status ipsius antiquissimus fuit per secula x. priora se. post Chr. nat. ad Ann. 1000 usque ex historic Sax. monumentis compilatus et geogr. designatus, per Frid. Zollmannum. Nuremberg, 1732. Tab. III. Size, 20 inches by 23.

*Dresden—*

## PARTS OF SAXONY.

**L.**—J. G.—Topographische Reisekarte durch die umliegende Gegend von Dresden. Von J. G. L. 1804. Size, 9 inches by 14. With list of Altitudes. Two copies.

**MEISSNER.**—Reisekarte von Dresden über Bischoffswerda durch die Südliche Hälfte der Oberlausitz, &c. Von G. B. Meissner.—Profluisse durch die Oberlausitz und Höhenmessung, &c. nach Angabe v. Gersdorf's, v. Charpentier's, und v. Schachmann's. Gez. von G. B. Meissner. Size, 21 inches by 27.

—Topog. grundriss vom Plauenschen grunde zwischen Dresden und Tharant. Size, 5 inches by 16.

*Saxon Switzerland—*

**KEYL.**—Situations Plan der Saxischen Schweiz, oder Gegend zwischen Dresden und Boehmen. Plan de Situation, &c. Gez. u. gest. v. C. Keyl in Dresden. Size, 10 inches by 16.

—Plan von der Sogenannten Sächsischen Schweiz. Dresden. Size, 9 inches by 12.

*Tharant—*

Grundriss der Stadt Tharant und umliegenden Gegend. Size, 7 inches by 9.

## SAXE DUCHIES.

**S. R. I.** Comitatus Henneberg, secundum Prefecturas et Modernas Dynastias, una cum confini Pr. Coburgensi, &c. Nuremberg, 1743. Size, 20 inches by 23; scale, 2' to 1 inch.

Now divided among Saxe Weimar, S. Coburg, S. Meiningen, Prussia, and H. Cassel.

# WURTEMBERG.

CARY.—A new Map of the Circle of Swabia,\* divided according to the Congress of Vienna. By John Cary. 1819. Size, 19 inches by 21; scale, 7' to 1 inch.

DIEWALD.—Karte von Schwaben,\* nach Bohnenberger und Amans aufnahme und der Vermessung der Kön. Baier. Laender bearbeitet. Von Joseph Diewald. 1809. Size, 23 inches by 29; scale, 6' to 1 inch.

\* Swabia is divided among Wurtemberg, Baden, Bavaria, and Hohenzollern.

COTTA.—Land- und Höhen Karte von Wurtemberg, mit Angabe der Posten. 23 Feb. 1826. Stuttgart. Size, 20 inches by 13; scale, 8' to 1 inch. (2 copies.)

SCHÜBLER.—Höhen Charte von Würtemberg und den benachbarten Gegenden, mit Bemerkung der mittlern Temperatur, &c. Von G. Schübler, Professor in Tübingen. Size, 15 inches by 18.

# HOLLAND.

ARTHAU.—Carte de Belgique, de Hollande, et du Grand Duché de Luxembourg. Gravée par J. M. Arthau. Brussels, 1841. Size, 30 inches by 23; scale, 9' to 1 inch.

DIEWALD.—Das Königreich der Niederlande. Von J. N. Diewald. Nuremberg. 1817. Size, 23 inches by 20; scale, 14' to 1 inch.

SEPP.—De VII. Vereenigde Nederlandsche Provincien naar de nieuwste Meetingen nauwkeurig geteekend en in 't koper gebragt door Christian Sepp en Zoon. Amsterdam, 1773. Size, 42 inches by 50; scale, 3½' to 1 inch.

*Gelders—*

VISSCHER.—Ducatus Geldriae et Zutphaniae Comit. Per Nic. Visscher. Size, 18 inches by 23.

*Over-Yssel—*

VISSCHER.—Transsalania provincia; vulgo Over-Yssel. Auctor N. ten Have. Sch. Zwol-Courect. Edita vero per Nic. Visscher. Size, 18 inches by 23.

*Zutphen—*

VISSCHER.—Novissima Comitatus Zutphaniae totiusque fluminis isulae descriptio, per Nic. Visscher. Size, 18 inches by 23.

# BELGIUM.

## GENERAL MAPS.

FROMENT.—Carte de la Belgique, Etab. Géog. de Bruxelles, &c. Editeur Froment. Size, 17 inches by 21; scale, 8' to 1 inch.

GIRAUD, &c.—Carte topographique de la Belgique, gravée à l'échelle de 1 à 80,000, dressée sous la direction de P. Giraud, Inspecteur du Cadastre, et de Ph. Vandermaelen, &c. On 22 sheets. Size of each sheet, 24 inches by 30. (Sheets 12, 13, 16, 17, only.)

GROELAERS.—Carte générale des Chemins de Fer projetés dans la province de Limbourg. Fait par S. W. Groelaers. Brussels, 1840. Size, 22 inches by 31.

VAULTIER.—Les Campemens des Armées du Roy de France et des Alliés aux Pays-Bas depuis l'année 1690 jusques à présent. Par le Sr. Vaultier. Amsterdam. Size, 19 inches by 23.

Carte du Royaume des Pays-Bas et de la Belgique. Brussels. Size, 41 inches by 33; scale, 6' to 1 inch.

Carte des relais et des routes de Poste de la Belgique. Brussels, 1830. Size, 14 inches by 18.

PARTS OF BELGIUM.

*Antwerp—*

Plan de la Ville et des Environs d'Anvers. 1832. Paris, 1832. Size, 12 inches by 16.

Plan de la Ville et de la Citadelle d'Anvers. Size, 18 inches by 25.

Plan de la Place d'Anvers, et de ses Environs, pour suivre les Opérations du Siège de la Citadelle par l'Armée Française sous les ordres du Mar. Gérard, Décembre, 1832. Size, 17 inches by 24.

*Brabant—*

Carte de la Province de Brabant, indiquant les Routes construites, celles qui sont en construction, et celles qui ne sont qu'en projet. Brussels, 1839. Size, 25 inches by 33.

*Flanders—*

SIMONEAU.—Nouvelle Carte de la Province de la Flandre occidentale. Par Simoneau. Brussels, 1833. Size, 23 inches by 19; scale,  $2\frac{1}{2}'$  to 1 inch.

*Ghent, Bp. of—*

BOUGE, J. B. DE.—Carte du Diocèse de Gand. Par J. B. de Bouge, Géomètre et Géographe de Duché de Gueldres. 1793. Size, 31 inches by 37.

*Mons—*

JAILLLOT.—Plan et Environs de Mons, levée sur les lieux et mis au jour par le Sr. Jaillot, &c. Paris, 1746. Size, 18 inches by 26.

*Namur—*

JAILLLOT.—Carte Topographique du Comté de Namur, qui comprend le cours de la rivière Sambre depuis Fontaine-l'Evêque jusqu'à Namur, et celui de la Meuse depuis Bouvines jusqu'à Huy, &c. &c. Levée géométriquement sur les lieux et mise au jour par le Sr. Jaillot, Géographe ordinaire du Roy. Paris, 1750. On 12 sheets, with 2 Titles and Dedication extra.

*Ostend—*

Plan du Port de la Ville et des Environs d'Ostende. Brussels, 1839. Size, 28 inches by 23.

CANALS AND ROADS OF BELGIUM.

MASUI.—Provinces de Limbourg et d'Anvers. Projet des travaux à exécuter pour l'Irrigation des Bruyères et la Canalisation des Rivières et Ruisseaux de la Campine. Plan général, fait et dressé par l'Ingénieur Masui. Brussels, 1840. (?) Size, 21 inches by 28.

VIFQUAIN.—Ouvrages d'Art du Projet de Canalisation de l'Escaut et de la Lys, avec Canal de Jonction. L'Inspecteur de Ponts et Chaussées, J. B. Vifquin. Size, 18 inches by 22.

VIFQUIN.—Projet de Canalisation de l'Escaut par barrages éclusés, et de la Lys avec écluses à sas, avec Canal de Jonction entre les deux rivières. Dessèchement des Marais de la rive droite de l'Escaut. Par J. B. Vifquin. Brussels, 1835. Size, 34 inches by 54.

Plan général des Polders submergés sur les deux rives de l'Escaut. Brussels, 1836. Size 17 inches by 22.

WOLTERS.—Projet d'un Canal de Jonction de la Lys au Canal d'Ypres. Par J. Wolters. Brussels. Size, 23 inches by 41; scale, 1:20,000.

Carte de Navigation de Mons à Compiègne, montrant les Exploitations de Mines de Hailles du Nord et de Jemappes, les Points d'Embarcation, Rivages de ces Mines, et les Péages concédés au Sr. Honoré. Size, 12 inches by 29.

Manufactories, Quarries, Mines, &c., situated on the proposed Line of Railway from Charleroy to Vireux. Geological Map of Country to be traversed by the Railway from the Sambre to the Meuse. Size 21 inches by 31.



- Navigation Charbonnière de la Belgique vers Paris. 1840. Brussels. Size, 28 inches by 24.
- Plans des Chemins de Fer du Haut et Bas Flenn. Brussels. Size, 11 inches by 16.
- Carte générale du Canal d'Ecoulement des Eaux des Flandres. Dressée par les Ingénieurs en chef des deux Flandres. Brussels, 1830. Size, 18 inches by 75.

## FRANCE.

### GENERAL MAPS.

- ARROWSMITH, A.—Map of France, Belgium, and part of Switzerland from Cassini, National Atlas, Ferrari, Weiss, &c. By A. Arrowsmith. 1817. On 6 sheets. Size of each, 30 inches by 40; scale, 7' to 1 inch. (2 copies.)
- BERGHAUS.—Frankreich mit besonderer Rücksicht auf die Unebenheiten; im Maastabe von 1:2000000 abgebildet von H. Berghaus. Berlin, 1824. Size, 23 inches by 24; scale, 27' to 1 inch.
- BOUCHER.—Carte synthétique des principaux Fiefs et Domaines, qui par réunion successive à la Couronne ont relevé la Monarchie Française sous les Rois de la 3me Race. Ensemble les nouvelles Possessions cédées à la République par le traité de Lunéville sous le Consulat de Bonaparte. Par N. Boucher et P. Picquet. Paris, an 12 (1804). (No. 2.) Size, 19 inches by 32; scale, 40' to 1 inch.
- BOUCHET.—Carte synthétique des accroissements successifs de la puissance des Francs dans la Gaule sous les Rois des 1re et 2me Races. Par N. Bouchet and P. Picquet. Paris, an 12 (1804). Size, 18 inches by 27; scale, 40' to 1 inch.
- D'ANVILLE.—Gallia antiqua ex Ævi Romani Monumentis eruta, et Serenissim. Carnisum Ducis Munificentia publici juris facta. Auctor D'Anville, &c. 1760. London, 1794. Size, 19 inches by 24; scale, 26' to 1 inch.
- DE FER.—Carte Élémentaire de la Navigation du Royaume sur laquelle est indiqué tout ce qui a été dit, fait et pensé, et ce qui restoit à proposer de plus important sur cette matière intéressante, &c. Par M. De Fer de la Nouerrie, &c. 1787. Size, 20 inches by 29.
- DÉPÔT DE LA GUERRE.—Spécimen de la Nouvelle Carte de la France, exécutée et gravée par les soins du Dépôt de la Guerre, à l'Echelle de 1:80,000. Size, 7 inches by 7.
- 
- Carte de l'Empire François avec ses établissements politiques, militaires, civils, et religieux. Dressée au Dépôt Gen. de la Guerre par ordre de S. Ex. le Ministre, &c., Alex. Berthier. An XII. (1804). Size, 26 inches by 36; scale, 28' to 1 inch.
- DERVAL.—Estat Général du Royaume de France, sur les degrez de M. Sanson. Par E. A. C. Derval. Size, 22 inches by 32.
- DEZAUCH.—Carte Botanique de France pour la 3me édition de la Flore Française. Par A. G. Dezauch, fils. An XIII. (1804). Size, 21 inches by 26; scale, 33' to 1 inch.
- DUPAIN-TRIEL.—Carte Physique et Hydrographique de la France, &c. Par le Sr. Dupain-Triel, fils. Paris, 1782. Size, 20 inches by 22; scale, 29' to 1 inch.
- 
- La France considérée dans les différentes hauteurs de ses Plaines: ouvrage spécialement destiné à l'instruction de la jeunesse. Par J. L. Dupain-Triel, Géographe du Roy. Paris. Size, 20 inches by 22.
- 
- Carte de la France où l'on a essayé de donner la Configuration de son Territoire par une nouvelle méthode de nivellements. Par Dupain-Triel. An X. (1802). Size, 20 inches by 22.

\***DUPAIN-TRIEL.**—Tableau Géographique de la Navigation Intérieure du Territoire de l'Empire Français, &c. Par J. L. Dupain-Triel. Revue en 1811 par V. Dabrena. Size, 45 inches by 46.  
Another copy, 1816.

• **FADEN.**—A correct Map of France according to the New Divisions into Metropolitan Circles, Departments, and Districts, as decreed by the National Assembly Jan. 15, 1790, from a reduced copy of M. Cassini's large map, &c. By William Faden. London, 1806. On 4 sheets, in 2 parts. Size, 50 inches by 47; scale, 12' to 1 inch.

**HÉRISSE.**—Royaume de France divisé en 86 départemens avec la distance comptée de Paris en lieues de poste, &c.; comprenant aussi les anciennes Provinces. Dressée par Hérissé en 1817. Corrigée en 1818 par Goujon. Size, 17 inches by 18; scale, 45' to 1 inch.

**LE GENDRE-DÉCLUY.**—Carte Spéciale Topographique et Statistique des Vignobles de la France. Par Le Gendre-Décluy, Ing. Civil. 1852. Paris. Size, 23 inches by 32; scale, 31' to 1 inch.

**LEMIÈRE.**—Carte des Productions Gastronomiques de la France avec ses Chemins de Fer. Lemière, éditeur. Paris, 1852. Size, 20 inches by 24.

**LENDER.**—Nouvelle Carte Statistique de la France, dressée d'après le dernier recensement, et contenant, 1° Le nom de chaque département et sa population; 2° Le nom du chef-lieu, sa population et sa distance de Paris; 3° Le nom des sous-préfectures et leur population; 4° Les fleuves de France, leur source et leur embouchure, &c. Par Ch. Lender. Paris, 1851. Size, 19 inches by 22.

**MENTELLE, &c.**—Carte Physique de la France. Par E. Mentelle et P. G. Chancelier. An VI. (1798). Size, 14 inches by 18; scale, 46' to 1 inch.

**PIQUET.**—Carte de l'Empire Français et du Royaume d'Italie avec une partie des Etats qui sont sous la protection de l'Empereur Napoléon. Par Ch. Piquet. Rédigée par Piquet, et dressée par Lapie. 1811. Size, 22 inches by 37; scale, 40' to 1 inch.

**POIRSON.**—Carte Physique, Hydrographique, Routière, et Statistique du Royaume de France, avec la Division comparative en Provinces et Départemens, &c. Par J. B. Poirson. Paris, 1816. Size, 38 inches by 48; scale, 21' to 1 inch.

**SOTZMANN.**—Part of France, east of the meridian of Calais; without tide, &c.; labelled "Sotzmann's Frankreich" (?). 16 sheets, mounted, in 4 parts. Size of each sheet, 11 inches by 17.

\*. \* The range of sheets between Dijon and Arles is wanting.

**STREIT.**—Charte von Frankreich. Von F. W. Streit. Nuremberg, 1815. Size, 22 inches by 24; scale, 28' to 1 inch.

**TARDIEU.**—Carte Physique et Hydrographique de la France, ou Carte Figurative des Navigations, &c. Gravée par P. F. Tardieu. Size, 16 inches by 18. (2 copies, one being coloured ethnographically by G. B. G.)

**TARDIEU, P.**—Carte des Routes de Poste de France, dressée par ordre de M. le Directeur Général des Postes. Par Pierre Tardieu, graveur. 1827. Size, 21 inches by 24; scale, 29' to 1 inch.

Carte des Traités. Size, 14 inches by 11.

Carte des Gabelles. Size, 15 inches by 11.

Carte Gastronomique de la France. Size, 15 inches by 17.

The Post-Roads of France and its additional Territory, comprising the whole 103 departments, &c. London, 1809. Size, 21 inches by 19.

Map of France in Departments extending to the Rhine and the Po. MS. without date, &c. Size, 21 inches by 25.



PARTS OF FRANCE.

*Aube—*

DÉPÔT DE LA GUERRE.—Département de l'Aube extrait de la Carte Topographique de la France. Paris, 1845. Size, 54 inches by 71; scale, 1:80,000.

*Bouches-du-Rhône—*

Tableau Géographique et Statistique du Département des Bouches-du-Rhône. (Atlas Géographique et Statistique des départemens de la France, No. 12.) Paris, 1827. Size, 16 inches by 19.

*Burgundy—*

HOMANN.—Comitatus Burgundiae . . . Nova representatio geographica facta a Joh. Bapt. Homano. Nuremberg. Size, 23 inches by 20; scale, 6' to 1 inch. (Two Copies.)

*Champagne—*

HOMANN.—Tabula Geographica Campaniae . . . a Joh. B. Homanni S. C. M. Geog. Haerede. Nuremberg. Size, 23 inches by 20; scale, 7' to 1 inch.

*Corsica—*

DÉPÔT DE LA GUERRE.—Carte Topographique de l'Île de Corse dressée par ordre du Roi d'après les opérations géodésiques et les levées du Cadastre exécutés de 1770 à 1791, et dirigés par feu MM. Testeraude et Bedigis. (Dressée par Mr. Jacotin.) Gravée au Dépôt-général de la Guerre, &c. Paris, 1824. On 8 sheets; size complete, 84 inches by 50. Scale, 1:100,000.

*Côte d'Or—*

NOELLAT.—Nouvelle Carte Topographique, Statistique et Rontière du Département de la Côte d'Or; réduite de la Grande Carte de Cassini, par J. B. Noellat, &c. 1821-1828. Size, 32 inches by 26; scale 2½' to 1 inch.

*Jura—*

DÉPÔT DE LA GUERRE.—Département du Jura extrait de la Carte Topographique de la France. Paris, 1844. Size, 54 inches by 66; scale, 1:80,000.

*Languedoc—*

NOLIN.—Gubernatio generalis Languedociae Occitania olim dictae . . . ad fidem prototypi Nolimani delineata, &c. Nuremberg, 1742. Size, 20 inches by 23; scale, 11' to 1 inch.

*Lyon, Generality of—*

HOMANN'S HEIRS.—Propriae Lugdunensis Generalitatis Mappa Chorographica. La Généralité propriétaire de Lyon, &c. Solus des Héritiers d'Homann. 1762. Size, 20 inches by 23; scale, 5' to 1 inch.

*Nîmes, Dioc. of—*

GAUTIER.—Le diocèse de l'évêché de Nîmes. Par le Sr. Gautier. Amsterdam. Size, 19 inches by 25.

*Nord—*

BOUGE.—Carte du Département du Nord ou les provinces de Flandre, du Hainaut et du Cambresis. Par J. B. de Bouge. Revue en 1793. Size, 17 inches by 44.

*Normandy—*

HOMANN'S HEIRS.—Normannia Galliae celebrii Provincia in terras suas et Balliatus divisa, ex prototypo de l'Isliano in hanc formam redacta curantibus Homannianis Heredibus. Nuremberg. Size, 20 inches by 23; scale, 6' to 1 inch.

*Puy de Dôme—*

DESMAREST.—Carte Topographique et Minéralogique d'une partie du Département du Puy de Dôme dans la ci-devant Province d'Auvergne où sont déterminées la Marche et les Limites des matières fondues et rejetées par les volcans ainsi que les courants anciens et modernes pour servir aux recherches sur l'Histoire Naturelle des Volcans. Par M. Desmarest, &c. Paris, 1823. On 6 sheets; size of each, 26 inches by 22; scale, 1½ inch to 1'.



*Puy de Dôme—*

DESMAREST.—Carte Générale ou Tableau d'Assemblage de la Carte Topographique et Minéralogique d'une partie du Département du Puy de Dôme dans la ci-devant Province d'Auvergne. Par Mr. Desmarest, &c. Paris, 1823. Size, 21 inches by 21. Scale,  $1\frac{1}{2}$ ' to 1 inch.

*Rhône—*

NOELLAT.—Nouvelle Carte Topographique et Statistique du Département du Rhône réduite d'après la grande Carte de Cassini, &c., par J. B. Noellat, &c. 1827. Size, 34 inches by 25; scale,  $1\frac{1}{2}$ ' to 1 inch.

PARIS.

ANDRIVEAU-GOUJON.—Carte des enceintes et sièges de Paris. Par J. Andriveau-Goujon. Paris, 1841. Size, 19 inches by 24; scale, 1:50,000.

LECLERC.—Nouveau plan routier de la Ville de Paris. Leclerc, Paris, 1839. Size, 16 inches by 22.

MAIRE.—Carte Topographique et Statistique des Environs de Paris donnant la population de chaque Commune, avec des notes sur ce qu'il y a de plus curieux à y voir. Par Maire, Geog., 1827. Size, 15 inches by 20.

PICQUET.—Plan routier de la Ville de Paris ou Guide des Etrangers, &c. Picquet, Paris, 1827. Size, 23 inches by 36.

ZAKRZEWSKI.—Nouveau Plan de la Ville de Paris, &c. 1839. Par Alex. Zakrzewski, Paris. Size, 17 inches by 24.

Nouveau Plan de la Ville de Paris. Weimar, 1802. Size, 17 inches by 20.

*Versailles—*

Plan de la Ville, du Château et du Parc de Versailles, de Trianon, &c. Size, 20 inches by 16.

Plan of Paris. London, 1814. On a Card; size, 5 inches by 6.

SPAIN AND PORTUGAL.

GENERAL MAPS.

ARROWSMITH, A.—A new Military Map of Spain and Portugal, compiled from the Nautical Surveys of Don Vincent Tofiño, &c., &c. Republished by A. Arrowsmith (1823). On 12 sheets in 6 parts; size of each sheet, 22 inches by 22; scale, 8' to 1 inch.

CALMET-BEAUVOISIN.—Mapa General de Espana y Portugal o nuevo Atlas compuesto en 63 pliegos por el Caballero Maria Antonio Calmet-Beauvoisin, Oficial Superior del Real Cuerpo de Ingenieros de Francia. Paris, 1821. Size of each sheet, 22 inches by 35; scale, 3' to 1 inch.

The only sheets in the collection are, 1, 2, 3, 4, 5, 6, 7, 52, 53, 61, Tableau d'Assemblage.

CAPITAINE.—Carte de la partie nord-est de l'Espagne, faisant suite à la Carte de la France par Capitaine, 1822-1823. On 13 sheets, and Tableau d'Assemblage extra. Size of each, 24 inches by 18; scale, 5' to 1 inch, or 1:345,630.

\*. \* Sheet 24 is wanting, and 22 and 23 are in duplicate. The numbers of the sheets are continued from Capitaine's Map of France.

DAVIDOS.—Spanien und Portugal, &c. Espagne et Portugal d'après les dernières Observations Astronomiques, les Nouvelles Cartes espagnoles gravées ou Manuscrites, et l'Atlas de Thomas Lopez. Dressée par C. F. Davidos. 1820, Vienna. Size, 47 inches by 54; scale, 13' to 1 inch.

DONNET.—Mapa Civil y Militar de España y Portugal con la nueva División en distritos, enriquecido de los planes particulares de 34 Ciudades y Puertos principales, &c. Por Don Alejo Donnet. Paris, 1823. On 6 sheets; size of each, 24 inches by 35; scale, 12' to 1 inch, or 1:750,000.

GUILLEMINOT.—Carte itinéraire de l'Espagne et du Portugal dressée par ordre de S. E. M. le Maréchal Duc de Bellune, sous la direction de M. le Lieutenant-Gen. Comte Guilleminot, Directeur-Gen. du Dépôt de la Guerre. Paris, 1823. Size, 53 inches by 70; scale, 10' to 1 inch.

HISRICHS.—Nouvelle Carte Politique, Militaire et Routière de l'Espagne et du Portugal où l'on voit toutes les Forteresses et Places Fortes (environ 400), les chaînes des montagnes, les limites des provinces, les routes de poste et grands chemins; par J. C. Hisrichs. Leipzig, 1812. Size, 20 inches by 23; scale, 37' to 1 inch.

LOPEZ.—Carte des Royaumes d'Espagne et de Portugal où l'on a marqué les Routes de Poste, et les limites des diverses Provinces et Gouvernements. Par Thomas Lopez, &c. Paris, 1808. Size, 32 inches by 41; scale, 17 to 1 inch.

PICQUET.—Carte des Routes de Postes et itinéraires d'Espagne et de Portugal; par Ch. Picquet. Dressée par Lapie. 1813. Vienna. Artaria and Co. Size, 20 inches by 25; scale, 33' to 1 inch.

#### PARTS OF SPAIN.

##### *Balearic Islands—*

B—N.—Carte des Isles de Majorque, Minorque, et Yvice. Par N. B. Dépôt de la Marine. 1740. Size, 17 inches by 24; scale, 6' to 1 inch.

LOPEZ.—Insularum Mallorca et Cabrera, Charta Geographica, opera et studio Domini Thomas Lopez, etc. Nuremberg, 1798. Size, 18 inches by 12; scale, 5' to 1 inch. (2 copies.)

—Mapa de la Isla de Mallorca y de la de Cabrera. Por D. Tomàs Lopez. 1773. Size, 17 inches by 30; scale, 3' to 1 inch.

MUNTANÉR.—A. S. A. R., etc. Mapa de la Ysla de Mallorca su, etc. Antonio Desping y Dameto. 1784. Joseph Muntaner la gravó en Mallorca, año 1785. Size, 49 inches by 62; scale, 1' to 1 inch.

ROCHETTE, DE LA.—A Topographical Map of the Isle of Minorca, geometrically surveyed by the Royal Engineers, while it remained in possession of the French during the last War, and digested by L. S. de la Rochette. 1780. London. Size, 25 inches by 40; scale, 14' to 1 inch.

##### *Catalonia—*

HOMANN.—Principatus Cataloniae necnon Comitatum Ruscinonensis et Cerretaniae nova Tabula edita a Jo. Bapt. Homanno. Nuremberg. Size, 20 inches by 23; scale, 8' to 1 inch.

##### *Marcia—*

LOPEZ.—Marcia Regnum Auctore T. Lopez. 1798. Nuremberg. Size, 18 inches by 12; scale, 10' to 1 inch.

##### *Pyrenees—*

ARROWSMITH, A.—A Map of the Pyrenees and the adjacent Provinces, by Roussel and Blottiere, with additions from Toffino and Lopez. By A. Arrowsmith. London, 1809. On 10 sheets. Size of each, 21 inches by 17; scale, 4' to 1 inch.

##### *Valencia—*

CAVANILLES.—Mapa del Reyno de Valencia Por Don Antonio Josef Cavanilles. Año 1795. Size, 28 inches by 17; scale, 7' to 1 inch.

#### PORTUGAL.

ARROWSMITH, A.—Map of the Roads of Portugal. A. Arrowsmith. London, 1811. Size, 23 inches by 32.

JEFFERYS.—Mappa ou Carta geografica dos Reinos de Portugal e Algarve. Por T. Jefferys. London, 1790. On 6 sheets, in 3 parts. Size of each part, 23 inches by 36; scale, 6' to 1 inch.



- Chorographical Map of the kingdom of Portugal, divided into its Grand Provinces. London, 1797. Size, 30 inches by 21; scale, 12' to 1 inch.

*Tagus R.—*

- CHAPMAN, &c.—A Topographical Chart of the Entrance of the River Tagus, describing the Coast from Cape Roca to Sacavem; with the Harbour and Environs of Lisbon. The nautical part is from a survey taken in 1806, by W. Chapman, R.N. The interior and line of coast from surveys made by Officers of the Q. M. G. department. London, 1810. Size, 24 inches by 37; scale, 1½ inch to 1'.

## SWITZERLAND.

### GENERAL MAPS.

- ARROWSMITH, A.—Map of the Alpine Country in the South of Europe. By A. Arrowsmith. London, 1833. On 4 sheets. Size of each, 25 inches by 31; scale, 7' to 1 inch.
- HOMMEYER.—Zeichnung der Schweiz nach einer geometrischen Construction entworfen. Von H. G. Hommeyer, etc. 1801. Size, 16 inches by 20.
- KELLER.—Karte der Schweiz gez. v. H. Keller. (Keller's Map of Switzerland, without table and date.) Size, 21 inches by 28; scale 7' to 1 inch.
- MENTELLE AND CHANLAIRE.—Carte Physique et Politique de la Suisse. Par E. Mentelle, etc., et P. G. Chanlaire. Paris. An VI. (1799). Size, 14 inches by 18; scale, 12' to 1 inch.
- RAUSCH.—Carte de la Suisse où l'on a marqué les routes suivies par Mr. Wil. Coxe, dans ses quatre Voyages en 1776, 1779, 1785, et 1786, et la route de Madame de K—, que le rédacteur recommande aux Dames, etc. (Division de la Suisse avant la Révolution et l'invasion de 1798.) Rausch, sc. Nuremberg. Size, 21 inches by 30; scale, 7' to 1 inch.
- Another copy. Weimar, 1802.
- STIELER.—Die Schweiz entw. u. gez. v. Ad. St. (Stieler), 1820-1834. Size, 12 inches by 16; scale, 13' to 1 inch.
- WALKER.—Hochen-Karte der Schweiz von J. Walker. Solothurn, 1840. Size, 22 inches by 34; scale, 1:400,000.
- WEISS.—Carte Générale de l'Atlas Suisse. Par J. H. Weiss. Size, 22 inches by 29; scale, 7' to 1 inch.
- Schweiz und Graubünden. Nouvelle Carte Hydrographique et Routière de la Suisse. Par J. H. Weiss, etc. Strasburg, an VIII. (1800). Size, 29 inches by 33; scale, 6' to 1 inch.
- Carte d'une Partie très intéressante de la Suisse à l'usage des Voyageurs. Elle renferme principalement une partie du Canton de Berne et du Valais, et les glaciers qui dominent les frontières d'Italie. Par J. H. Weiss, aux dépenses de J. R. M. à Aarau. 1796. Size, 31 inches by 21; scale, 1' to ½ inch.
- Nouvelle Carte itinéraire dressée pour servir de Guide aux Voyageurs dans les XXII. Cantons de la Confédération Suisse. Par J. H. Weiss. Berne, 1820. Size, 16 inches by 20; scale, 10' to 1 inch, or 1:700,000.
- Nouvelle Carte de la Suisse, dans laquelle sont exactement distingués les treize Cantons, leurs alliés et leurs sujets. London, 1799. Size, 26 inches by 35; scale, 5' to 1 inch.
- Karte der Schweiz mit besonderer Rücksicht auf Hydrographie. Munich, 1830. Size, 16 inches by 21; scale, 11' to 1 inch, or 1:800,000.

### PARTS OF SWITZERLAND.

*Alps—*

- EBEL.—Abriss des Alpen Gebirges der Schweiz. Ebel del. Size, 6 inches by 40.



*Bernese Oberland—*

Carte de l'Oberland Bernois d'après la Triangulation Trigonométrique des années 1811-1818.—Bern, 1852. Size, 17 inches by 20; scale, 3' to 1 inch.

*Genève—*

DUFOUR.—Carte Topographique du Canton de Genève levée par ordre du Gouvernement dans les années 1837 et 1838. Echelle de 1 pour 25,000. G. H. Dufour dirigit. Size, 40 inches by 52.

*Goldau, etc.—*

Prospekt und Charte der Gegend um Goldau und den Lowerzer See zur Erläuterung des Absturzes vom Ruffiberge am 2 Sept. 1806. Weimar, 1807. Size, 9 inches by 7.

*Lucerne Canton—*

•Karte des Kantons Luzern mit den angrenzenden Theilen anderer Kantone. Luzern, 1838. Size, 20 inches by 27; scale, 2' to 1 inch.

*Lucerne Lake—*

SCHMID.—Carte du Lac de Lucerne ou des Quatre Cantons. Dessiné par August. Schmid. Size, 11 inches by 14; scale, 5' to 3 inches.

*Neuchâtel—*

OSTERVALD.—Carte de la Principauté de Neuchâtel levée de 1801 à 1806, etc. Par J. F. Osterwald. Paris. Size, 20 inches by 22; scale, 4' to 3 inches. (2 copies.)

*St. Gothard Mt.—*

Carte Topographique du Mont St. Gothard et des différentes Vallées qui y viennent aboutir. Pour servir d'explication au précis des événements militaires mentionnés dans le troisième volume de la description des Alpes Grecques et Cottiennes. Size, 12 inches by 16.

*Schaffhausen—*

CLERMONT.—Carte du Canton de Schaffhausen réduite d'après celle que Henri Peyer dédia, en 1638, au Conseil Souverain de cette République, etc. Par le Sieur Clermont, 1780. Size, 14 inches by 18; scale, 4' to 3 inches.

SWISS PANORAMAS BY KELLER.

Panorama vom Freudenberg bey St. Gallen nach der Natur gezeichnet 1819, von H. Keller. Zurich, 1821. Size, 5 inches by 125.

Ansicht, &c. Vue de la Chaine des Alpes et du Lac de Constance dessiné à Heiligenberg en Souabe par H. Keller. Zurich, 1821. Size, 5 inches by 128.

Panorama vom Rigiberg gezeichnet von H. Keller. Zurich, 1815. Size, 9 inches by 75.

Panorama vom Uetliberg bey Zürich. H. Keller fecit. Size, 5 inches by 66.

— von Zürich. H. Keller fecit. Size, 5 inches by 57.

Aussicht vom Weissenstein auf dem Jura, Canton Solothurn. Von H. Keller. 1817, Zurich. Size, 9 inches by 75.

ITALY.

GENERAL MAPS.

ARROWSMITH, S.—Map of South Italy and adjacent Coasts. By S. Arrowsmith. 1833, London. On 4 sheets; size of each, 26 inches by 33: scale 9' to 1 inch.

AUSTRIAN STAFF.—Carta delle Poste e Stazioni Militari per le Provincie d'Italia tanto Austriache che Estere con parte dei paesi limitrofi. Delimitata ed incisa sotto la direzione dell' I. R. Stato Maggiore Generale, nell' Istituto Geografico Militare in Milano. 1820. Size, 30 inches by 30; scale, 26' to 1 inch.

**BORDIGA.**—Carta dell' Italia colle presenti sue Divisioni Politiche approvata dalla Direzione Generale di Pubblica Istruzione per uso delle Scuole del Regno d' Italia. Costrutta ed incisa dalli F. Bordiga. Milan, 1812. Size, 27 inches by 22; scale, 24' to 1 inch. Two copies.

**BOTTA.**—Carta Militare d' Italia per servire alla Storia d' Italia di Carlo Botta. Size, 30 inches by 24; scale, 25' to 1 inch.

**COLLETTA.**—Carta degli Itinerarj Militari da Bologna a tutto il Regno di Napoli, diretta dal Ten. Gen. Giuseppe Parisi. Costrutta da P. Colletta nell' anno 1809. Leop. Laperuta dis. Size, 34 inches by 33; scale, 13' to 1 inch. Two copies, one of which omits the authors' names from the title.

**D'ANVILLE.**—Tabula Italiae Antiquae Geographica quam Excel. Dom. Dux de la Rochefoucauld in aere incidit curavit. Auctor d'Anville, 1764. London, 1794. Size, 26 inches by 20; scale, 28' to 1 inch.

**DELAMARCHE.**—Carte de la République Italienne constituée par la Consulta à Lyon le 6 Pluviose, An X. (26 Janvier, 1802) divisée en 12 Départemens. Avec la République Ligurienne, &c. Par C. F. Delamarche. Paris, An XI. (1803.) On 2 sheets; size of each, 27 inches by 20; scale, 7' to 1 inch.

**FRENCH GOVERNMENT.**—Carta Amministrativa del Regno d' Italia co' suoi Stabilimenti Politici, Militari, Civili e Religiosi; e con una parte degli stati limitrofi. Costrutta nel Deposito della Guerra. 1811-1813. On 8 sheets; size complete, 52 inches by 44; scale, 7' to 1 inch, or 1: 500,000.

\*.\* One copy in 4 parts, and another in 6 parts.

**GÜSEFELD.**—Charte von Cisalpinien. Von F. L. Gusefeld. Nuremberg, 1798. Size, 20 inches by 23; scale, 11' to 1 inch.

**HOMANN'S HEIRS.**—Italia in suos Status divisa ex d'Anvilliano, Rizzi Zannonioque prototypis desumpta. Curantibus Homannianis Haeredibus. Nuremberg, 1790. Size, 23 inches by 20; scale, 30' to 1 inch.

**ORGIAZZI.**—Carte Statistique, Politique et Minéralogique de l'Italie, où sont tracées toutes les Routes, Relais, et Distances de Postes, &c. Par J. A. Orgiazzi. Paris, 1816. On 2 sheets. Scale, 16' to 1 inch.

\*.\* Only a portion of the South sheets, the rest is wanting.

**Carte Générale et Routière d'Italie.** Milan, 1818. Size, 28 inches by 22; scale, 25' to 1 inch.

## SARDINIAN STATES.

### IN TERRA FIRMA.

**BORGONIO.**—Carta Corografica degli Stati di S. M. il Re di Sardegna data in Ince dal Ingegnere Borgonio nel 1683, corretta ed accresciuta nell' anno 1772. On 25 sheets; size, mounted together, 80 inches by 100; scale, 3' to 1 inch.

———— Another copy, mounted, in 5 parts.

**BORDIGA.**—Carte Militaire du Piémont et de la République Cisalpine. Cette Carte est destinée à tracer les Dispositions relatives aux Mouvements et aux Marches des Troupes Françaises, &c. Gravée par Bordiga. Milan, —. Size, 28 inches by 43; scale, 12' to 1 inch.

**CARY.**—A new Map of the Kingdom of Sardinia according to the Congress of Vienna, with their Subdivisions. By John Cary. 1819, London. Size, 19 inches by 21; scale, 10' to 1 inch.

**NOLIN.**—Les Etats de Savoye et de Piémont, &c. Par J. B. Nolin. Paris, 1696. Size, 32 inches by 25; scale, 6' to 1 inch.

**ROBERT DE VAUGONDY.**—Duché de Savoye qui comprend le Chablais, le Fossigny, le Génevois, la Savoye Propre, la Tarentaise et la Maurienne, dressé d'après la Grande Carte de Piémont de Tomaso Borgomo et autres, par le Sieur Robert de Vaugondy. Corrigé, &c., par C. F. Delamarche. Size, 20 inches by 21; scale, 44' to 1 inch.



**SARDINIAN STAFF.**—Carta degli Stati di Sua Maestà Sarda in terra firma, opera del Real Corpo di Stato Maggiore Generale, 1841. On 6 sheets; size of each, 24 inches by 36; scale, 1:250,000 or  $3\frac{1}{4}$ ' to 1 inch.

— Carta degli Stati di S.M. Sarda in terra firma ridotta al 1:500,000 nell' Ufficio Topografico dello Stato Mag. Gen., 1846. Size, 30 inches by 33, scale, 7' to 1 inch.

Piemonte diviso in sei Dipartimenti. Size, 25 inches by 20; scale, 7' to 1 inch.

Topografia del Piemonte attuale, ovvero Carta Itineraria dei Regii Stati in terra firma. 1828, Turin. Size, 18 inches by 15; scale, 15' to 1 inch.

#### ISLAND OF SARDINIA.

**MARMORA.**—Carta dell' Isola e Regno di Sardegna, &c. dal Mag. Gen. Cte. Alberto Ferrero della Marmora, &c., assistito dal suo Collaboratore il Cav. D. Carlo de Candia, &c. Paris and Turin, 1845. Size, 55 inches by 35; scale, 1:250,000.

**ZANNONI.**—Nuova Carta dell' Isola e Regno di Sardegna opera del R. P. Tomaso Napoli delle Scuole Pie, &c., et del Cavaliere Rizzi Zannoni, Direttore del Buro Topografico della Guerra, &c. 1811. Size, 33 inches by 23; scale, 3' to 1 inch.

#### PARTS OF SARDINIA.

*Genoa*—

**CANIANI.**—Carta Militare di Genoa e suoi contorni. Giuseppe Caniani inc. in Milan, 1820. Size, 22 inches by 18.

Carta Militare di Genova e suoi contorni. London, 1800. Size, 17 inches by 17; scale, 2 inches to 1 mile.

*Mont Blanc*—

**P—, M. A.**—Carte de la partie des Alpes qui avoisine le Mont Blanc. M. A. P. fecit. Size, 17 inches by 21. Two copies.

**RAYMOND.**—Carte Physique et Minéralogique du Mont Blanc et des Montagnes et Vallées qui l'avoisinent. Par J. B. Raymond, Capit. &c. Paris. Size, 24 inches by 34.

*Mont Blanc, Dept.*—

**RAYMOND.**—Le Département du Mont Blanc réuni à la République Française par Decret de la Convention Nationale du 29 Nov. 1792. Par le Citoyen J. B. Raymond, Ing. Géog. Size, 24 inches by 27.

*Mont Cenis*—

**BEAUMONT.**—Chart of Places connected with the Route from Coni in Piedmont (via Mt. Cenis) to Lyons in France, including likewise the principal Peaks of that chain of the Alps from Mont Blanc to Mont Buchette, near Genoa. (A. Beaumont, del.) Size, 16 inches by 19; scale, 13' to 1 inch.

**PICQUET.**—Carte Topographique et Militaire du Mont Cenis et de la nouvelle Route qui le traverse de Lans-le-bourg à Suse. Par P. Ch. Picquet fils, &c. Paris, 1821. Size, 20 inches by 16; scale, 14 inch to 1'.

**RAYMOND.**—Carte Topographique du Mont Cenis et de la nouvelle Route qui le traverse de Lanslebourg à Suse. Par le Capitaine Raymond, Ing. Géog. Paris. Size, 19 inches by 15; scale, 1:50,000.

*Po, Dept. of*—

**PERTINCHAMP.**—Carte générale du Département du Po, extraite de la grande Carte générale de l'Ingénieur Borgonio, &c. Par Mons. La Ramée Pertinchamp. Turin, 1807. Size, 22 inches by 33.



*Turin—*

**Carta Topografica dei Contorni di Torino** pel Circuito di trenta e più miglia, che comprende la maggior parte del Piemonte. *Turin*, 1816. Size, 20 inches by 25; scale, 3' to 1 inch.

**Città e Territorio di Torino.** Size, 24 inches by 19. Two copies.

**Torino attuale coi decretati progetti Ingrandimenti.** 1827. Size, 14 inches by 22.

**TUSCANY.**

**INGHIRAMI.**—Carta Geometrica della Toscana ricavata dal vero nella proporzione de 1 a 200,000, &c. dal Giovanni Inghirami, delle Scuole Pie. *Florence*, 1830. On four sheets; size of each, 30 inches by 24.

*Elba, Is.—*

**PIQUET.**—Carte de l'Isle d'Elbe, dressée d'après les Opérations Trigonométriques extraites du Traité de Géodésie de Mr. Puissant. Par Ch. Picquet. *Paris*, 1814. Size, 16 inches by 21; scale, 2' to 1½ inch.

*Florence—*

**BARDI.**—Pianta Topografica e Veduta Generale della Città di Firenze. (Presso Lorenzo Bardi.) North sheet. Size, 19 inches by 25.

**ERMIRIO, &c.**—Carta Topografica dei Contorni a dieci miglia dalla Città di Firenze. Disegnata da Girolamo Ermirio, incisa da G. Canacci, e scritta da Gaetano Giarè. *Florence*. Size, 24 inches by 33. Two copies.

*Sienna—*

**MUCCI.**—Pianta della Città di Sienna, presso Guido Mucci in Sienna.

**PARMA, &c.**

**AUSTRIAN STAFF.**—Carta Topografica dei Ducati di Parma, Piacenza, e Guastalla, levata dietro misure trigonometriche negli anni 1821, 1822, &c. Disegnata ed incisa in Milano nell'Istituto Geografico Militare dell'I. R. Stato Mag. Gen. Austriaco. 1828. On nine sheets. Size of each, 18 inches by 27; scale, 1:86400, or 1½' to 1 inch.

**PONTIFICAL STATES.**

**BORDIGA.**—Nova Carta degli Stati Pontifici Meridionali. *Milano*, 1820. G. B. Bordiga, inc. On four sheets, mounted together, with a postal map and tables of heights, distances, &c., on two sheets extra. Size of the map, 40 inches by 38; scale 3' to 1 inch.

**CASSINI.**—Lo Stato Ecclesiastico diviso nelle sue Provincie con le Regioni adiacenti. Delinato sulle ultime osservazioni dal P. D. Gio. M. Cassini, C.R.S. *Roma*. Presso la Calcografia Camerale. 1805. On 15 sheets, in 6 parts. Size complete, 78 inches by 74; scale, 3¼' to 1 inch.

**Carta del Territorio della Repubblica Romana diviso nei suoi Dipartimenti.** *Florence*. Size, 30 inches by 22; scale, 6' to 1 inch.

*Bologna—*

**COMASTRI.**—Pianta Topografica della Città di Bologna. Angelo Comastri. 1822. Size, 22 inches by 34.

*Rome—*

**BROCCHI.**—Carta fisica del Suolo di Roma ne' primi tempi della fondazione di questa Città. Da G. Brocchi, membro dell'I. R. Istituto. 1821. Size, 18 inches by 24.

**BROWNE.**—A new Map of Rome, showing its ancient and present situation. By Christopher Browne. *London*. Size, 20 inches by 24.

*Rome—*

GELL.—*Munificentia, &c. Latium Vetus et regiones conterminas, Etruriam, Sabina, Aequorum, Volscorumque, juxta faciem hodiernam, post plurimas trigonometricas Observationes et locorum percrutationes a Wilhelmo Gell, Eq. Brit.; delineatum ab Antonio Nibby, Prof. Archaeol. 1828. Size, 30 inches by 33.*

MOLTKE.—*Carta Topografica di Roma e dei suoi Contorni fino alla distanza di 10 miglia fuori le mura, indicante tutti i siti ed edifizii moderni ed i ruderi antichi ivi esistenti. Eseguita coll' appoggio delle osservazioni astronomiche e per mezzo della mensola delineata sulla proporzione di 1 : 25000 dal Barone di Moltke, &c. negli anni 1845 a 1846. Berlin, 1852. On two sheets. Size of each, 21 inches by 33; scale,  $2\frac{1}{2}$  inches to 1 Eng. mile.*

MONALDINI.—*Vestigia di Roma Antica. Venanzio Monaldini. Rome, 1819. Size, 25 inches by 34.*

NOLLI.—*Rome: Silvio Valentini . . . Administro Urbis Iconographiam a Leonardo Bufalino ligneis formis evulgatam servata proportione contractam atq. aeri incisam Jo. Bapta Nolli, &c. Rome, 1748. Size, 18 inches by 27.*

——— *Pianta Topografica di Roma moderna estratta dalla grande del Nolli, an. 1818. Size, 25 inches by 34.*

SICKLER.—*Plan Topographique de la Campagne de Rome, dessiné et expliqué par F. C. L. Sickler, Dr. à l'usage des voyageurs. Seconde Edition. Rome, 1816. With a Memoir, in French, and a panorama of the City. Size of the plan, 23 inches by 33.*

VASI.—*Roma antiqua triumphatrix ex vetustis monumentis expressa. Apud Marianum Vasi. Rome, 1792. Size, 17 inches by 26.*

WYLD.—*Rome and its Environs. By James Wyld. London, 1849. Size, 10 inches by 11.*

*Pianta della Città di Roma, con la indicazione di tutte le Antichità e Nuovi Abbellimenti. Rome, 1837. Size, 30 inches by 45.*

*Terni—*

*Excursione alla Caduta delle Marmore di Terni. Rome, 1826. Size, 17 inches by 24.*

## THE TWO SICILIES.

### KINGDOM OF NAPLES.

SCHRAEMBL.—*General Karte von dem Königreiche Neapel oder Napoli, verfasst von Herrn Joh. Ant. Rizzi Zannoni. Neu herausgegeben von Herrn F. A. Schraembl. Vienna, 1789. On 4 sheets. Size of each, 26 inches by 18; scale, 6' to 1 inch. Mounted in 3 parts.*

ZANNONI.—*Atlante geografico del regno di Napoli delineato per ordine di Ferdinando IV., &c. Da G. A. Rizzi Zannoni, nel Anno 1816. Naples. On 31 sheets. Size of each, 22 inches by 31; scale,  $1\frac{1}{2}$ ' to 1 inch.*

——— *Carta geografica della Sicilia Prima o sia Regno di Napoli disegnata da Gio. Ant. Rizzi Zannoni Padovano, &c. e fatta incidere per ordine del Rè delle due Sicilie in Parigi nel 1769. On 4 sheets. Size of each, 26 inches by 18; scale, 6' to 1 inch. Two upper sheets wanting.*

*Naples, City and Environs—*

NEAPOLITAN GOVERNMENT.—*Carta topografica et idrografica dei Contorni di Napoli levata per ordine di S. M. Ferdinando I<sup>o</sup>, &c. dagli ufficiali dell' Stato Maggiore e dagl' ingegneri topografi negli anni 1817, 1818, 1819. Disegnata ed incisa nell' ufficio Topog. di Napoli. On 12 sheets. Size of each, 24 inches by 36; scale, 3 inches to 1'. 2 copies of sheet 5.*

*Plan des fouilles de Pompéi. Naples, 1819. Size, 10 inches by 15; scale, 350 feet to 1 inch.*



*Naples, City and Environs—*

**NEAPOLITAN GOVERNMENT.**—Pianta della Città di Napoli e de' suoi Contorni. Delineata ed incisa nel Reale Ufficio Topografico della Guerra. Naples, 18 . Size, 28 inches by 38; scale,  $9\frac{1}{2}$  inches to 1'.

—— Pianta della Città di Napoli. Eseguita nel R. Ufficio Topografico. Size, 3 inches diameter; scale, 1 : 80,000. 4 copies.

—— Golfo di Napoli. No title or date. Reduced from 'Carta topog. et idrog. dei Contorni di Napoli,' on 10 sheets. 1817-1819. On 1 sheet. Size, 24 inches by 36; scale, 1' to 1 inch.

**RUSO.**—Pianta della Città di Napoli. Del. nel 1813 da Giosué Russo. Incisa da Dom. Guerra. Size, 10 inches by 13; scale, 1 : 20,000, or  $4\frac{1}{2}$  inches to 1'.

—— Contorni di Napoli. G. Russo, del. Size, 10 inches by 13; scale, 4' to 1 inch.

**ZANNONI.**—Pianta della Città di Napoli come esiste nel presente anno 1790. J. A. Rizzi Zannoni. Size, 23 inches by 33.

—— Topografia dell' agro Napoletano con le sue adiacenze. Delineata dal R. Geografo G. A. Rizzi Zannoni. 1793. Size, 24 inches by 33; scale,  $1\frac{1}{2}$  inch to 1'.

—— Carta del Littorale di Napoli e de' luoghi antichi più rimarchevoli di quei Contorni. Delineata per ordine del Re da G. A. Rizzi Zannoni, Geog. di S. M. 1794. Size, 21 inches by 33; scale, 2' to  $1\frac{1}{2}$  inch.

**SICILY, ISLAND OF.**

**GHISIUS-COMENSIS.**—Nuova ed estatta Carta corografica della Sicilia. Ritratta da più celebri Scrittori Antichi e Moderni, e dalle più recenti Osservazioni intorno alle Città, Castelli, Monti, Fiumi, Porti, Promontori, &c. tanto dello stato antico, quanto del moderno. In cui sono notate le curiosità della natura e dell' arte, a beneficio degli Amatori della Storia Civile e Naturale, e delle Antichità. Rome, 1779. Joannes Baptista Ghisius Comensis. On 6 sheets, in 2 parts. Size, 50 inches by 58; scale,  $4\frac{1}{2}$ ' to 1 inch.

**MYLNE.**—The Island and Kingdom of Sicily, according to the best Observations, and improved from the Map of the Baron de Schmettau, Q.-M.-Gen. to the Imperial Army in the War of 1718, 1719, and 1720; from the Map of Messrs. Don C. Ventignilio and A. D'Aldone, and from Mr. D'Anville and others. By Robert Mylne, F.R.S. on a Journey in 1737. London, 1799. Size, 20 inches by 27; scale, 7' to 1 inch.

**SCHMETTAU.**—Carte von Sicilien zur Übersicht der Feldzüge in den Jahren 1718-19-20. (Von Baron de Schmettau.) Size, 20 inches by 27.

**SMYTH.**—Carte generale della Isola di Sicilia, compilata, disegnata ed incisa nell' officio topografico di Napoli su i migliori materiali esistenti, e sulle recenti operazioni fatte dal Cavaliere Guglielmo Errico Smyth, Capitano della Reale Marina Britannica. 1826. On 4 sheets. Size of each, 22 inches by 27; scale,  $3\frac{1}{2}$ ' to 1 inch.

—— Comparative Heights of the Mountains of Sicily. Size, 27 inches by 20.

*Palermo—*

**LOSSIEUX.**—Pianta della Città di Palermo e suoi contorni. Dal Gaetano Lossieux. 1818. Size, 23 inches by 29.

**GREECE.**

**ALDENHOVEN.**—Carte du Royaume de la Grèce dressée au 400,000 d'après les triangulations et les levés de MM. les Officiers d'Etat Major de l'Armée Française, &c. Par Ferdinand Aldenhoven. Athens, 1838. On 8 sheets. Size of each, 24 inches by 18.

**ARROWSMITH, A.**—Map of Greece and adjacent Countries, with Ancient and Modern Names. (Reduced from one published in 6 sheets.) By A. Arrowsmith. London, 1824. Size, 27 inches by 32; scale, 17' to 1 inch.



- BARBIÉ DU BOCAGE.**—Carte de la Morée, dressée et gravée au Dépôt Gén. de la Guerre par ordre du Gouvernement en 1807. Paris, 1814. (Par M. Barbié du Bocage.) Size, 24 inches by 42; scale, 7' to 1 inch.
- D'ANVILLE.**—Græciæ Antiquæ Specimen Geographicum. Auctor D'Anville, &c. 1762. London, 1794. Size, 21 inches by 20.
- DE L'ISLE.**—Græciæ Antiqua, &c. Auctor Gulielmus De l'Isle, &c. London, 1794. On 2 sheets. Size of each, 21 inches by 27; scale 18' to 1 inch.
- FRIED.**—Carte comparative de la Grèce Ancienne et Moderne, dessinée et rédigée sur les meilleurs matériaux, par F. Fried. Vienna, 1824. Size, 30 inches by 44; scale 21' to 1 inch.
- LAPIE.**—Carte physique, historique, et routière de la Grèce dressée au 400,000 d'après les matériaux recueillis par M. le Lieut.-Gen. Comte Guillemillot, &c. Par le Chev. Lapie, &c. Paris, 1826. On 4 sheets. Size, 42 inches by 62; scale, 5' to 1 inch. 4 copies.
- LEAKE.**—Northern Greece, from the Isthmus to Macedonia and Illyria, including a portion of those two Provinces. By W. M. Leake. London, 1836. Size, 22 inches by 28; scale, 10' to 1 inch.
- SOMMER.**—Athènes et ses Environs, par Jean Adolphe Sommer, ing. geog. &c. Munich, 1840. Size, 24 inches by 28; scale, 1½ inch to 1'.

## TURKEY IN EUROPE.

### GENERAL MAPS.

- COTTA.**—Das Osmanische Reichs in Europa mit einem Theile desselben in Asien nebst den angränzenden oesterreichischen und russischen Gebieten in dem stande vom Jahre 1828. Munich. On 6 sheets; size, 57 inches by 48; scale, 14' to 1 inch. Three copies.
- LAPIE.**—Carte générale de la Turquie d'Europe en xv feuilles dressée sur les matériaux recueillis par M. le Lieut.-Gén. Comte Guillemillot, Directeur-Général du Dépôt de la Guerre, et M. le Maréchal de Camp Baron de Tromelin, &c. Par le Chevalier Lapie, &c. Paris, 1822. Size of each sheet, 16 inches by 21; scale, 11' to 1 inch.
- MOLLO.**—Europäische und Asiatische Turkey, &c., im Jahre 1808. Bey T. Mollo. Vienna. Size, 22 inches by 30; scale, 60' to 1 inch.
- PALMA.**—*Χάρτης της Ευρωπαϊκής Τουρκίας* \* \* \*. Carte de la plus grande partie de la Turquie d'Europe, &c. Par Gaetan Palma. Triest, 1814. Size, 30 inches by 43; scale, 17' to 1 inch.
- , E.—Græciæ pars superior cum regionibus a Septentrione adjacentibus. The Northern part of Turkey in Europe, excepting Moldavia. E. P. construxit et delin. London. Size, 9 inches by 11; scale, 50' to 1 inch.
- REICHARD.**—Der Europäische Theil des Türkischen Reichs von C. G. Reichard. Nuremberg, 1816. Size, 24 inches by 31; scale, 28' to 1 inch.
- RHODE.**—Partes confines trium Magnorum Imperiorum Austriaci, Russici et Ottomanici, &c. A. T. C. Rhode, Acad. suprad. Geog. Anno 1785. On 6 sheets; size of each, 20 inches by 18; scale, 36' to 1 inch.
- WEISS.**—Carte der Europäischen Turkey, nebst einem Theile von Klein Asien in xxi Blättern nach den besten Hülfquellen ent. u. gez. durch den K. K. Oberlieutenant Franz von Weiss, herausgegeben von dem K. K. Öster. Generalquartiermeisterstabe. Im Jahre 1829. Size of each sheet, 18 inches by 25; scale, 8' to 1 inch.
- The same, transferred by the anastatic process, under the direction of Major Thos. Best Jarvis, r.s.s. London, 1834. Mounted, in 8 parts.
- WYLD.**—Map of the Country between Odessa and Constantinople. By James Wyld. London. Size, 31 inches by 20; scale, 20' to 1 inch.

**ZANNONI.**—Carte de la partie septentrionale de l'Empire Ottoman, contenant la Crimée, la Moldavie, la Valachie, la Bulgarie, avec la Nouvelle Russie, &c. Par le Sr. Rizzi-Zannoni, 1774. Venice, 1777. On 6 sheets; size of each, 18 inches by 23; scale, 20' to 1 inch. Sheet 6, S.E., is wanting.

Carte des Provinces septentrionales de l'Empire Ottoman. (In Arabic characters, with translation in MS.) Size, 22 inches by 47; scale 35' to 1 inch.

*Bessarabia, &c.—*

**RUSSIAN GOVT.**—KAPTA \* \* \*. Map of Bessarabia, Moldavia, Walachia, &c., in Russian. Engraved at the Imperial Topographical Depot, St. Petersburg, 1817. On 20 sheets, in 4 parts, with an Index Map; scale, 7' to 1 inch.

*Bosphorus—*

**FRIED.**—Plan de Constantinople, du Bosphore, et du Canal de la Mer Noire. Par F. Fried. Vienna, 1821. On 2 sheets; size, 30 inches by 22.

**MOLTKE.**—Karte des Nördlichen befestigten Theils des Bosphorus von den Hisaren bis zu den Leuchthürmen am Schwarzen Meer im Auftrage Sr. Hoheit Sultan Mahmoud II., mit dem Messtisch in 1:25,000 aufgenommen 1836-1837. Durch Freiherrn von Moltke, &c. Berlin, 1849. Size, 30 inches by 28.

*Constantinople—*

Plan de la Ville de Constantinople et de ses Faubourgs tant en Europe qu'en Asie, levée géométriquement. Paris, . Size, 19 inches by 27; scale, 450 mètres to 1 inch.

*Moldavia—*

**FRIED.**—General Charte von der Moldau. Entworfen von J. Riedl und unter dessen Leitung gezeichnet von F. Fried. Vienna und Pesth, 1811. Size, 23 inches by 22; scale, 10' to 1 inch.

**KIEPERT.**—Die Moldau. Entworfen von H. Kiepert. Weimar, 1849. Size, 16 inches by 12; scale, 14' to 1 inch.

*Montenegro, &c.—*

**S**——, C. T.—Nuova Carta Topografica delle Bocche di Cattaro, Monte-Negro, e parte dell' Albania. Delinata dal Sig. C. T. S. Venice, 1785. Size, 18 inches by 24; scale, 24' to 1 inch.

**TRAUX.**—Carte des Bouches de Cattaro et du Montenegro. Par Max. de Traux. 1808. Vienna. Size, 16 inches by 23.

**KARACRAY.**—Carte du pays de Montenegro, &c. Par M. le Comte Fedor de Karacray, Colonel au service d'Autriche. Size, 18 inches by 24; scale, 4' to 1 inch.

*Wallachia—*

**AUSTRIAN STAFF.**—Topographische Karte der Grossen und Kleinen Wallachey aus verschiedenen Recognoscirungs Plänen des K. K. Generalquartiermeisterstaabs im Jahre 1790 zusammengetragen. Herausgegeben im Jahre 1812. Size, 21 inches by 36.

**DIRWALDT.**—Mappa specialis Valachiae ex melioribus Mappis et plurimis delineationibus specialibus deducta. Opera Josephi Dirwaldt. Vienna, 1816. Size, 23 inches by 37; scale, 7' to 1 inch.

**FRIED.**—General Charte der Walachey nach allen vorhandenen Hilfsmitteln bearbeitet und gezeichnet von Franz Fried. Vienna und Pesth, 1811. Size, 19 inches by 26; scale, 10' to 1 inch.

**KIEPERT.**—Die Walachei. Von H. Kiepert. Weimar, 1849. Size, 15 inches by 24; scale, 11' to 1 inch.

*Serbia, &c.—*

**KIEPERT.**—Serbien nach Oesterreichischen und Russischen Aufnahmen und Ortsbestimmungen, und den Karten von Visquenel und Bugarski, entworfen von H. Kiepert. Weimar, 1849. Size, 16 inches by 19; scale, 11' to 1 inch.



*Servia, &c.*—

**RIEDL.**—Charte von Servien, Bosnien, und dem grössten Theile von Illyrien, nach bisher noch unbenützten Aufnahmen bearbeitet und als Fortsetzung der Charte des Herrn Obristen Lipsky, von Szedlicsna. In 4 sectionen gezeichnet von J. Riedl. Vienna, 1810. Size, 32 inches by 56; scale,  $6\frac{1}{2}'$  to 1 inch.

——— Charte von Servien, Bosnien, &c. Von J. Riedl. Vienna, 1816. On 2 sheets. Forming a supplement to Lipsky.

Charte von Servien. Another edition, 1810.

## EUROPEAN MOUNTAINS AND RIVERS PASSING THROUGH VARIOUS STATES.

### HARZ MOUNTAINS.

**BERGHAUS.**—Charte von dem Harz Gebirge, &c. Zuerst entworfen in 1817 von F. Julius; vollständig ausgeführt in 1818 bis 1821, von H. Berghaus; in Kupfer gestochen, &c., von H. Brosch. Berlin, 1822. Size, 16 inches by 21; scale, 1:196,990.

**GÜSEFELD.**—Charte vom ober-unter und Vor Harze, &c. Von F. L. Güssefeld. Weimar, 1804. Size, 19 inches by 23; scale, 3' to 1 inch.

**LASIUS.**—Petrographische Carte des Harz Gebirges. Von G. S. O. Lasius. 1789. Size, 21 inches by 33.

Special Charte von dem Harz-Gebirge, &c. Weimar, 1808. Size, 25 inches by 33; scale,  $2\frac{1}{2}'$  to 1 inch.

### DANUBE RIVER.

Carte du cours du Danube depuis Ulm jusqu'à son embouchure, &c.; ou Guide de Voyageur à Constantinople sur le Danube, &c. Vienna, 1841.

### LAHN RIVER.

Charte der Niederung der Lahn und ihrer Gegenthäler. Weimar, 1807. Size, 8 inches by 10. (Passing through the territories of Prussia, Hesse, Nassau.)

### THE RHINE.

**BEAURAIN, DE.**—Carte Topographique du Cours du Rhin depuis Bâle jusqu'à Mayence, dans laquelle sont compris le Sundgau, la Haute et Basse Alsace, les Evêchés de Vorins et de Spire, une partie du Palatinat et de l'Archêvêché de Mayence, la Bas Conté de Catzenellenbogen, le Territoire de Francfort, le Landgraviat de Hesse Darmstadt, le Marquisat de Bade, le Territoire d'Hannau, l'Ortenau, le Brisgau, &c.; sur laquelle on a tracés les mouvements et les positions des Armées Françaises et Allemandes pendant les campagnes de 1674 et 1675. Par le Chev. de Beaurain. Size, 12 feet long by 3 feet.

**ENGELMAN.**—Kart van den Rhynstroom, van boven de Stad Emmerik tot beneden de Stad Arnhem, &c. Van J. Engelman. The Hague, 1793. Size, 16 inches by 54.

**TARDIEU.**—Carte de la Rive Gauche du Rhin depuis Bâle jusqu'à Nimègue. An X—1802. Par Tardieu, Paris. Size, 20 inches by 10; scale, 4 inches to 1<sup>c</sup>.

## MEDITERRANEAN SEA AND ISLANDS.

**GRUBAS.**—Nuova Carta del Mare Mediterraneo estratta dalle migliori Carte, e da recenti Astronomi Osservazioni, &c. Dal \* \* \* Gio. Grubas, Piloto di Marina. Venice, 1801. Size, 30 inches by 80.

**G—, G. B. V.**—Nuova Carta del Mare Adriatico e suoi Golfi. Da G. B. V. G. Venice, 1815. Size, 21 inches by 29. Two copies.



*CXXIV Library and Map-Room of the Royal Geographical Society—*

**LAPIE.**—Carte réduite de la Mer Méditerranée et de la Mer Noire, &c. Par J. A. B. Rizzi Zannoni et P. Lapie, Ing. Géog. Paris, 1808. Size, 32 inches by 66.

**NEAPOL. GOVT.**—Carta ridotta del Mare Mediterraneo, costrutta nel Reale Ufficio Topografico. Naples, 1845. In 3 parts; size of each, 37 inches by 30.

**SCHRAEUBL.**—Karte des Mittellaendischen Meers Verfasst von Herrn Bonne. Neu herausgegeben von Herrn F. A. Schraeubl. Vienna, 1787. Size, 14 inches by 27; scale, 110' to 1 inch.

*Candia—*

**HOMANN.**—Insula Creta hodie Candia in sua iv. territoria divisa cum adjacentibus Egæi Maris Insulis ac præsertim nuperrime ex abyssso pelagi emergente Nova Santorini Insula, occasione cujus tam stupendi Naturæ Phænomeni Tabulam hæc curiosis spectandam, edidit Joh. Bapt. Homannus. Nuremberg. Size, 20 inches by 23; scale, 12' to 1 inch.

**TARDIEU.**—Carte de l'Isle de Candie, nommée par les Turcs, Ieriti. Gravée par Tardieu. Size, 21 inches by 28; scale, 7½' to 1 inch.

*Maltese Islands—*

**DEPALMEUS.**—Carte Générale de la Principauté Souveraine des Isles de Malte et du Goze, dressée sur les Mémoires des Grands Officiers de l'Ordre. Par A. F. G. Depalmeus, fils. Paris, 1752. In 2 parts. Size, 24 inches by 58.

**ROSSI.**—Isola di Malta, Gozzo, Comino, et Cominotto, cavata dalle piu recenti notizie, e data in luce da Gio. Giacomo de Rossi. Rome, 1686. Size, 17 inches by 23.

**SMYTH.**—Plano della Città, Porti, e Fortificazioni di Valetta nell' Isola di Malta. Rilevato dal Capitano G. E. (W. H.) Smyth, della Real Marina Britannica. Size, 22 inches by 15; scale, 6 inches to 1'.

**BLACK SEA.**

**RUSSIAN GOVERNMENT.**—Carte de la Mer Noire, d'Azof, et de Marmora, composée et gravée au Dépôt Impérial des Cartes en 1804, d'après les descriptions les plus récentes et les nouvelles déterminations astronomiques des Russes et des François. St. Petersburg, 1804. Size, 28 inches by 40.

**ASIA.**

**GENERAL MAPS.**

**ARROWSMITH, A.**—Map of Asia. . . . By A. Arrowsmith, 1818. London. On 4 sheets. Size of each, 32 inches by 38; scale, 75' to 1 inch.

**BAPTIST MISS. SOC.**—A Map illustrative of the Baptist Missionary Stations, and of the countries in which the translations of the Scriptures in the different Eastern languages are spoken; carrying on by the Missionaries at Serampore (S. E. Asia). London, 1815-19. Size, 13 inches by 17; scale, 4' to 1 inch.

**CASTALDI'S Maps.** On 3 sheets:—

1. Il disegno della prima parte del Asia. Laquale principia da Levante al Regno di Parse et alla provincia di Charassa e quella di Sabbesta et al Regno di Cabul e la provincia di Guzarate, &c. Giacomo di Castaldi, Piemontese et Cosmographo in Venetia. 1559. Size, 17½ inches by 29; scale, 110' to 1 inch.
2. Il disegno della seconda parte dell' Asia. Il quale principia da Levante al Fiume inda già detto indo, &c. Giacomo di Castaldi, Piemontese, Cosmographo in Venetia. 1561. Size, 19 inches by 29½; scale, 110' to 1 inch.
3. Il disegno della terza parte dell' Asia. Giacomo di Castaldi, Piemontese, Cosmographo in Venetia. 1561. Size, 25 inches by 29; scale, 167' to 1 inch.

DE WIT.—Nova Persiæ, Armeniæ, Natoliæ, et Arabiæ descriptio per F. de Wit. Amsterdam. Size, 20 inches by 23; scale, 125' to 1 inch.

KLAPROTH.—Carte de l'Asie Centrale, par M. J. Klaproth. Size, 6 inches by 12.

REICHARD.—Charte von Asien. Von C. G. Reichard. Weimar, 1812. Size, 21 inches by 26; scale, 4° to 1 inch.

SCHMIDT.—Asien. Gezeichnet von J. M. F. Schmidt, zu C. Ritter's Erdkunde. Berlin, 1819. Size, 21 inches by 22; scale, 5° to 1 inch.

SCHNEIDER.—Asien. Nuremberg, 1793. Size, 20 inches by 24.

STREIT.—Charte von Asien, von F. W. Streit. Nuremberg, 1815. Size, 20 inches by 25; scale, 250' to 1 inch.

## RUSSIA IN ASIA.

### GENERAL MAP.

STRAHLENBERG.—Nova descriptio Geographica Tattariæ Magnæ tam Orientalibus quam Occidentalis in particularibus et generalibus Territoriis, una cum delineatione totius Imperii Russici imprimis Siberiæ accuratè ostensa. P. J. v. Strahlenberg. (Circa 1700.) Size, 27 inches by 41; scale, 110' to 1 inch.

————— Another copy; Western part only.

STREIT.—Charte von dem Russischen Reiche in Asien. Von F. W. Streit. Weimar, 1811. Size, 19 inches by 25; scale, 150' to 1 inch.

### CAUCASIAN PROVINCES.

KLAPROTH.—Carte de la Géorgie et du pays des Ossètes, Tscherkesses, et Mitzdheghbi. Par Jules Klaproth, 1823. Paris. Size, 21 inches by 15; scale, 12' to 1 inch.

PASEWITSCH.—Georgien und das Hochland Armenien als Überblick der Kriegs-Operationen der K. Russ. Armee unter Gen. Paskewitsch-Eriwansky. Munich, 1829. Size, 16 inches by 22; scale, 14' to 1 inch.

KOCH.—Karte von dem Kaukasischen Isthmus und von Armenien, &c. Von Prof. Dr. Karl Koch. Berlin, 1850. *Politische Gebiete*. Size, 36 inches by 48; scale, 14' to 1 inch.

————— The same. Botanically coloured.

————— Ethnographically coloured.

RUSSIAN STAFF.—Karte des Kaukasus nach den Neuesten Aufnahmen des K. Russ. Gen. Stabes entworfen. Berlin, 1838. Size, 20 inches by 26; scale, 24' to 1 inch.

————— Another Copy. 1840.

Uebersichts Karte der Russischen Provinzen Nördlich und Südlich vom Kaukasus. Munich, 1838. Size, 18 inches by 20; scale, 40' to 1 inch.

Caucasi Montes, Mingrelia, Imiretia, Georgia, Armenia, atque regionum vicinarum tabula novissima. Petropoli, 1793. Size, 24 inches by 20; scale, 20' to 1 inch.

### KAMTSCHATKA.

ERMAN.—Karte von Kamtschatka nach eigenen Astronomischen Ortsbestimmungen, Höhenmessungen, und Aufnahmen nach Kraschenikows Bestimmungen und nach den Aufnahmen der Ostküste durch die Capitaine Lütke und Beechey entworfen von A. Erman, Gen. von K. v. Reinhard. Berlin, 1838. Size, 33 inches by 24; scale, 22' to 1 inch.

“” With 6 pictures of volcanos and mountains.

# INDEPENDENT TARTARY.

**BATATZI.**—*Xagze*, . . . Charta, in quâ eruditiss. spectanda exhibetur pars Asiae (Tartary) quam ob varia viarum pericula et immensos itineris labores . . . nunc primum typorum ope publici juris, facta a me Basilio Batatzi . . . London, 1732. Size, 20 inches by 24.

*Aral and Khiva—*

**KHANIKOFF.**—Carte de la Mer d'Aral et du Khanat de Khiva. Dressée par Jacques de Khanikoff. Paris, 1851. Size, 28 inches by 17; scale, 24' to 1 inch.

*Bokhara—*

**LAPIE.**—Carte du Khanat de Boukhara et d'une partie des Steppes des Kirghiz. Dressée par le Colonel Baron de Meyendorff, revue par le Ch. Lapie, &c. Paris. Size, 18 inches by 14; scale, 63' to 1 inch.

*Caspian Sea and Bokhara—*

**MAAS.**—Nova Maris Caspii et regionis Usbeck cum provinciis adjacentibus vera delineatio. Per A. Maas. Nuremberg, 1735. Size, 20 inches by 23; scale, 11' to 1 inch.

# CHINESE EMPIRE.

**KLAPROTH.**—Carte de l'Ancienne Chine qu'elle estoit du temps d'Yao et telle qu'elle décrite dans un chap. du Chon King intitulé Yu Kong. Size, 11 inches by 16. MS. from the Klaproth Collection.

**STIELER.**—Das Chinesische Reich mit seinen Schutzstaaten nebst dem Japanischen Inselreiche. Gotha, 1833. Stieler's Hand Atlas. Size, 13 inches by 16.

**WYLD.**—Map of China. By James Wyld. London, 1840. Size, 25 inches by 32; scale, 1° to 1 inch. Two copies.

*Canton—*

**KLAPROTH.**—Carte des Huit Provinces du Tchao Sian. (From the Klaproth Collection, with MS. corrections.) Size, 29 inches by 20; scale, 19' to 1 inch.

— Another copy, with different MS. corrections.

*Canton—*

**CLARKE.**—Sketch of the Operations before Canton, by Capt. T. J. Clarke, R.N. (MS., no date.) Size 14 inches by 18.

*Hainan Island—*

**KLAPROTH.**—Carte de l'Île de Hainan, formant le Dép. Chinois de Khiong Tchou Fou. Par M. Klaproth. 1827, Paris. Size, 13 inches by 15; scale, 11' to 1 inch.

*Kiakta to Peking—*

**KAPTA** . . . Map from Kiakta to Peking through Mongolia, 1820 to 1821. (In Russian.) Size, 22 inches by 18.

*Loo-Choo Islands—*

**KLAPROTH.**—Carte du Royaume et des Îles de Lieou-Kieou, réduite d'après les Cartes Manuscrites que le R. P. Gaubil a dressées en Chine le 6 Novembre, 1752. (XI<sup>e</sup>. Carte pour la 3<sup>e</sup> partie des Considérations, &c.) Size, 14 inches by 10; scale, 84' to 1 inch.

*Peking—*

**JERVIS.**—Chinese Plan of the City of Peking. Facsimile of a map brought from Peking by an Italian Missionary, and purchased by Sir Woodbine Parish at Naples, in 1842. Lithographed, &c., under the direction of Major T. B. Jervis, R.E.S. 1843. On 4 sheets. Size of each, 19 inches by 22; scale, 10 inches to 1 mile.



## JAPAN.

ARROWSMITH, A.—Map of the Islands of Japan, Kurile, &c., with the adjacent coast of the Chinese dominions and a sketch of the River Amoor and the Baikal Lake, including the trading posts of Russia and China and their relative situations with Peking. Delineated by A. Arrowsmith, 1833. On 3 sheets, in 2 parts. Size, 52 inches by 66; scale, 30' to 1 inch. Two copies.

KAEMPFER.—Regni Japoniæ nova Mappa Geographica . . . delineata ab Engelberto Kaempfero, recusa et emendata a M. Scuttkero. Size, 20 inches by 23; scale, 36' to 1 inch.

Map of the Japanese Islands printed in Japanese characters. Size, 24 inches by 35.

## TURKEY IN ASIA.

### GENERAL MAPS.

REICHARD.—Charte des Osmanischen Reichs in Asien. Von C. G. Reichard. Weimar, 1804. Size, 20 inches by 26; scale, 31' to 1 inch.

WYLD.—Map of the Ottoman Dominions in Asia, with the adjacent Frontiers of the Russian and Persian Empires. By James Wyld. London, 1835. Size, 21 inches by 29; scale, 40' to 1 inch.

### PARTS OF TURKEY IN ASIA.

#### ASIA MINOR.

D'ANVILLE.—Asiæ, que vulgo Minor dicitur, et Syriæ tabula Geographica, &c. Auctor D'Anville, 1764. London, 1794. Size, 21 inches by 25; scale, 35' to 1 inch.

DE LA RUE.—Asia Minor, Authore Phi. de la Rue. Amsterdam (Mortier). Size, 16 inches by 22; scale, 46' to 1 inch.

KIEPERT.—Karte von Klein-Asien entworfen und gez. nach den neuesten und zuverlässigsten Quellen, haupt sächlich nach den in den Jahren 1838-39 von Baron v. Vincke, Fischer und Baron v. Moltke, &c. und 1841-43 von H. Kiepert, A. Schönborn, und K. Koch, ausgeführten recognoscirungen sowie nach den besten neueren reiserouten, vorzüglich der Engländer. Berlin, 1844. Size, 29 inches by 63; scale, 14' to 1 inch, or 1:1,000,000.

\*.\* Accompanied by Memoir über die construction der Karte von Klein Asien, &c. 8vo.

LEAKE.—Essay of a Map of Asia Minor. By W. M. Leake, Lieut.-Col. R.A. London, 1820. Size, 26 inches by 33; scale, 15' to 1 inch.

PATTERSON.—Asiæ Pars. Turkey in Asia. By the Rev. E. Patterson. Richmond, 1806. Size, 11 inches by 9; scale, 60' to 1 inch.

TCHIBATCHEF.—Carte Géographique de l'Asie Mineure, rédigée à l'échelle de 1:1,000,000 par A. de Bolotoff, Général à l'Etat-Major de Russie, d'après des matériaux inédits et les données fournies par P. de Tchibatchef. 1853. Paris. Size, 29 inches by 42.

#### Marmorice—

EDMONDS.—Marmorice Harbour, from a Survey by Capt. J. Edmonds, R.N. 1801. London, 1802. Size, 9 inches by 8.

#### MESOPOTAMIA.

VINCENT.—Map of Babylonis, Tigris, Euphrates, Eulæus, Pasitigris, and Susiana, chiefly from D'Anville, by W. V. (Vincent). London, 1797. Size, 6 inches by 9.

SYRIA.

- ARROWSMITH, A.—Sketch of the Countries between Jerusalem and Aleppo. By A. Arrowsmith. 1814. On 2 sheets; size, 54 inches by 33; scale, 6' to 1 inch.
- BRUYN.—*Palestina ex veteris ævi monumentis ac recentiorum observationibus illustravit Marinus Didericus de Bruyn.* Amsterdam, 1844. Size, 31 inches by 27; scale, 6' to 1 inch, or 1:450,000. With Memoir in Latin, "*Brevis Notitia*," &c. 8 pp. 4to.
- D'ANVILLE.—*Palestina.* By Monsr. D'Anville, &c. 1767. London, 1794. Size, 16 inches by 18; scale, 11' to 1 inch.
- HUGHES.—Canaan as divided by Joshua among the Tribes of Israel.—Palestine in the time of Jesus Christ.—The Countries traversed by the Israelites in their progress from Egypt to Canaan. 3 Maps. From an original drawing by W. Hughes. (Patent Illuminated Maps.) Size of each, 14 inches by 10.
- KIEPERT.—*Karte von Palaestina nach den besten Quellen, vorzüglich nach den Robinsonschen Untersuchungen.* Von H. Kiepert. Herausgegeben von Prof. Dr. Carl Ritter. Berlin, 1842. Size, 23 inches by 18; scale, 8½' to 1 inch.
- PALMER.—Map of Arabia Petraea, the Holy Land, and part of Egypt, Ancient and Modern, exhibiting their physical features, accompanied with Geological Notes, designed chiefly to illustrate . . . the Exodus and Journeys of the Israelites, &c. By Richard Palmer. London, 1841. In 2 parts; size, 52 inches by 38; scale, 9' to 1 inch.
- PAULTRE.—*Carte Physique et Politique de la Syrie, pour servir à l'Histoire des Conquêtes du Général Bonaparte en Orient.* Faite au Kaire en l'an 8 par Charles Paultre, &c., dessinée par Lapie. Paris, 1803. Size, 23 inches by 31; scale, 24' to 1 inch.
- PETERMANN.—Palestine. Outline and Hills printed in Colours, without title or names. Unfinished proof by A. Petermann. London, 1854. Size, 40 inches by 27.
- WILD.—Map of Syria, Ancient and Modern, by James Wyld, &c. 1840. London. Size, 39 inches by 25; scale, 6' to 1 inch.

ARABIA.

- JOMARD.—*Carte de l'Arabie et des pays circonvoisins, dressée d'après les documents les plus récents pour l'intelligence de l'Histoire de l'Égypte sous Mohammed Aly et des marches des troupes Égyptiennes.* Par M. Jomard. Paris, 1847. Size, 8 inches by 9; scale, 220' to 1 inch. With a Memoir.
- Yemen—*
- LOTTER.—*Terræ Yemen maxima pars, seu, &c.* Auctore C. Niebuhr. Tob. Cour. Lotter, Geogr., exend. Vienna, 1774. Size, 23 inches by 15.

PERSIA.

- CARY.—Persia, by John Cary. London, 1815? Size, 10 inches by 12; scale, 170' to 1 inch.
- REICHARD.—Persien, &c. Von C. G. Reichard. Weimar, 1809. Size, 22 inches by 28; scale, 65' to 1 inch.
- VINCENT.—Maps to Dr. Vincent's Commerce and Navigation of the Ancients. 1797.—No. 1. Plan of the Coast of Mekran from the Indus to the Persian Gulf, copied . . . from a MS. compiled by Mr. Dalrymple. 1795.—No. 2. Chart of the Gulf of Persia, copied . . . from Mr. Dalrymple's collection.—Map from D'Anville, Panjab from Arrian, Coast of Mekran from C. Robinson, intended to connect the march of the armies with the progress of the fleet.—Sketch of the South-east Angle of the Coast of Persia, by

Capt. A. Blair.—Sketch of the River Indus with the five Doabs.—Carte de la Babylonie, nommée aujourd'hui Hierac-Arab, avec les noms, tant anciens que modernes, et les routes des Expéditions de Cyrus et de Julien l'Apostat, aussi bien que celles de Texeira, Benjamin, &c. Ouvrage posthume de Guil. De l'Isle. Publié en Août 1766, par Jos. Nic. De l'Isle. Paris. Size, 23 inches by 18.

## AFGHANISTAN OR CABUL.

WALKER.—Map of Afghanistan and the adjacent Countries, &c. Drawn and Engraved by J. and C. Walker. London, 1844. Size, 31 inches by 26; scale, 30' to 1 inch.

MACARTNEY.—A Map of the Kingdom of Caubul and some of the neighbouring Countries, altered from a Map constructed in the year 1809. By Lieut. John Macartney. London, 1815. Size, 25 inches by 31; scale, 32' to 1 inch.

*Khyber-pass—*

LUSHINGTON.—Khyber-pass, surveyed by Major F. Lushington. Size, 9 inches by 5; scale, 1½ inch to 1 mile.

## INDIA.

### GENERAL MAPS.

ALLAN.—India. To the Right Hon. John Sullivan, M.P., &c., this Map of India is inscribed, &c., by A. Allan. 1818. Size, 33 inches by 27; scale, 1" to 1 inch. Two copies, plain and coloured.

CARY.—A New Map of Hindoostan. By John Cary. London, 1821. Size, 19 inches by 21; scale, 92' to 1 inch. Three copies.

——— Hindoostan. Central Division, Sindetic, Gangetic, and Southern. By John Cary. On 4 sheets; size of each, 10 inches by 12.

GREENOUGH.—General Sketch of the Physical and Geological Features of British India, by G. B. Greenough, Esq., F.R.S., &c. &c. On 9 sheets; size, 7½ inches by 66; Scale, 24' to 1 inch. Two copies.

HEWITT.—Hindoostan. Hewitt, sc. Size 10 inches by 8.

INDIAN GOVT.—A Map of the Seat of War in India, 1817-18. Compiled and drawn for the use of the Commander-in-Chief's Office, Fort William, Bengal, and published by permission. London, 1820. Size, 29 inches by 24; scale, 30' to 1 inch.

——— Maps illustrative of the European connection with India and of the British Administration of its several Departments. London, 1833. Five Maps in a cover.

KIEPERT.—Karte von Alt-Indien. A Map of Ancient India, with the Indian Classical and principal Modern Names to illustrate Prof. Lassen's Indian Antiquities. Drawn by Henry Kiepert. Berlin, 1853. Size, 30 inches by 25; scale, 70' to 1 inch or 1:5,000,000.

KIDLINGER.—Hindoostan. (In the language.) T. Kidlinger, des. Printed at the Asiatic Lith. Press, for the Netherlands Missionary Society. Size, 15 inches by 11.

LAMBTON.—Plan of the Trigonometrical Operations carried on in the Peninsula of India from the year 1802 to 1814 inclusive, under the superintendence of Lieut.-Colonel W. Lambton. On 8 sheets; size of each, 22 inches by 32; scale, 7' to 1 inch. Two copies.

Soc. D. U. K.—India. On 11 sheets, published under the superintendence of the Society for the Diffusion of Useful Knowledge. Mounted together and coloured to distinguish the River Basins.



**WALKER.**—Map of India, showing the British Territories and those of the Native States. By John Walker, Geographer to the East India Company. On 6 sheets; size of each, 22 inches by 34; scale, 28' to 1 inch.

**WYLD.**—Map of India . . . the Civil and Military Stations . . . arranged under the direction of Captain R. M. Grindlay, by James Wyld. 1838. Size, 39 inches by 27; scale, 35' to 1 inch.

\*. \* Also Index to Wyld's Map of India, in 1 vol.

#### PARTS OF INDIA.

Map of the Peninsula of India, from the 19th Degree North Latitude to Cape Comorin. 1792, London. On 2 sheets; size, 40 inches by 33; scale, 18' to 1 inch.

The Southern Countries of India, from Madras to Cape Comorin, describing the Routes of the Armies commanded by Colonels Fullarton and Humberston during the Campaigns of 1782, 1783, and 1784. Surveyed by Colonel Kelly, Capt. Wersebe, and others. London, 1788. Size, 35 inches by 41; scale, 10' to 1 inch.

Western India, exhibiting the Lines surveyed in detail and explored by the Great Indian Peninsula Railway Company, 1847. London. Size, 39 inches by 26; scale, 9' to 1 inch. Two copies.

#### Assam—

**ARROWSMITH, A.**—Map of Assam, on the same scale as the Map of India. A. Arrowsmith. London, 1816. Size, 21 inches by 30; scale, 14' to 1 inch.

#### Bhamboorda—

Plan of Bhamboorda and Environs, on the Moola River (Scindiah's Dominions). MS., on tracing paper. Size, 19 inches by 23; scale, 3 inches to 1 mile.

#### Bombay Pres.—

**INDIAN GOVT.**—Route Map of the Bombay Presidency, surveyed and collected by the Quarter-Master-General's Department, Bombay Army. Bombay, 1832. On 3 sheets; size of each, 19 inches by 34; scale, 10 English miles to 1 inch. Table of Distances, &c.

#### Daskroee Purgunnah—

**INDIAN GOVT.**—Plan of the Daskroee Purgunnah, Ahmedabad Collectorate; compiled and reduced from the original Plans by the Officers of the Revenue Survey Department during the years 1820, 1821, 1822. Size, 34 inches by 23; scale, 1 English mile to 1 inch.

#### Ganges—

**ANQUETIL.**—Carte Générale du Cours du Gange et du Gagra, dressée sur les Cartes particulières du P. Tiefentaller, J. Missionnaire Apostolique dans l'Inde. Par M. Anquetil du Perron. Paris, 1784. Size, 24 inches by 30; scale, 43' to 1 inch.

#### Himalaya—

**GRIMM.**—Karte des Hohen Himalaya in Gurwhal, Kemacon, Almoora; mit den Quellen des Ganges, Indus, Soildsch. Entworfen von J. L. Grimm, und herausgegeben von C. Ritter. 1832. Size, 17 inches by 22; scale, 12' to 1 inch.

#### Konkan—

**JERRIS.**—Plan of the Trigonometrical Operations carried on in the Konkan Province, from the Year 1824 to 1829 inclusive, under the superintendence of Capt. T. B. Jervis. MS., on tracing paper. (No. 8.) Size, 51 inches by 28; scale, 7' to 1 inch.

— Sketch of the Konkan, or Western Coast of India, exhibiting the geographical distribution of Plants. (No. 13.) MS., on tracing paper. Size, 51 inches by 28.

*Konkan—*

JERVIS.—Analyses of the Industry and Resources, the External and Internal Commerce, the Produce and Taxation of the British and Foreign Territories on the North-west Coast of Peninsular India. (No. 14.) MS., on tracing paper. Size, 51 inches by 28.

*Malabar—*

ARROWSMITH, A.—Map of the Province of Malabar, &c. By A. Arrowsmith. London, 1809. Size, 40 inches by 27; scale,  $4\frac{1}{2}'$  to 1 inch.

*Nepal—*

KIRKPATRICK.—Map of Nepaul, with the Routes, &c., of Captain Kirkpatrick. London, 1811. Size, 20 inches by 30; scale, 6' to 1 inch.

*Punjab—*

ARROWSMITH, J.—Map of the Punjab, Kashmir, Iskardu, and Ladhak; comprising the dominions of Runjeet Singh. Compiled from original documents, particularly from the detailed MS. map of Baron Charles Hügel. By John Arrowsmith. London, 1849. Size, 28 inches by 27; scale, 17' to 1 inch.

WALKER.—Map of the Punjab, Western Hindlaya, and adjoining parts of Tibet, from recent Surveys, and based upon the Trigonometrical Survey of India. Compiled by order of the Hon. Court of Directors of the East India Company, by John Walker, Geographer to the Company. London, 1854. Size, 27 inches by 40; scale, 14' to 1 inch.

*Sinde—*

Skeleton Map of Sindé (rough woodcut). Size, 8 inches by 4. Two copies.

### ASIATIC ARCHIPELAGO.

ARROWSMITH, A.—Chart of the East India Islands, exhibiting the several Passages between the Indian and Pacific Oceans. By A. Arrowsmith. London, 1824. On 4 sheets; size of each, 27 inches by 40; scale, 40' to 1 inch.

ARROWSMITH, S.—Chart of the Passages between Booro, Gilolo, Ceram, and New Guinea, &c. By S. Arrowsmith. 1832. Size, 27 inches by 40; scale, 11' to 1 inch.

HINDERSTEIN.—Algemeene Kaart van Nederlandsch Oostindie, . . . te zamengesteld door G. F. Baron van Derfelden van Hinderstein. . . . 1842. On 9 sheets, including Index; size of each, 38 inches by 26; scale, 30' to 1 inch.

*Borneo—*

PETERMANN.—Map of Borneo, constructed principally from that of Baron Melvill de Carnbee, &c. By Augustus Petermann. London, 1851. Size, 24 inches by 19; scale, 17' to 1 inch.

*Java—*

VAN DE VELDE.—Kaart van het Eiland Java te zamengesteld, uit Officiële bronnen door C. W. M. Van de Velde, &c., 1845. On 2 sheets; size, 24 inches by 64; scale, 10' to 1 inch.

*Philippines—*

ARROWSMITH, S.—Chart of the Philippine Islands from the Spanish Chart. 1808. The adjacent islands are added from the latest Surveys. By S. Arrowsmith. London, 1832. Size, 40 inches by 27; scale, 22' to 1 inch.

### INDIAN OCEAN AND ISLANDS.

ARROWSMITH, A.—Chart of the Indian Ocean, &c. By A. Arrowsmith. 1823. On 4 sheets; size of each, 27 inches by 40; scale, 30' to 1 inch.

DALRYMPLE.—Mer des Indes. A copy of an ancient MS. Map in the British Museum (16th Cent.) With a Note by A. Dalrymple. London, 1790. Size, 19 inches by 25; scale, 5° to 1 inch.

*Maldives—*

**MORESBY.**—Trigonometrical Survey of the Maldeev Islands. By Commander R. Moresby and Lieut. F. T. Powell, Indian Navy, 1835. London, 1839. On 3 sheets; size, 128 inches by 25; scale, 4' to 1 inch.

*Mauritius—*

**DUFOUR.**—Ile de France, dressée par A. H. Dufour. 1836. Size, 7 inches by 5; scale, 7' to 1 inch.

*Red Sea—*

**Charte von den Arabischen Meerbusen nebst den Egiptischen, Ethiopischen, und Arabischen Küsten von Suez bis Babelmandeb von einer Reise durch Abyssinien nach der Hauptstadt Gondar und von da nach den Quellen des Nils, &c. Alles nach Observationen mit den besten Instrumenten bestimmt von James Bruce. (Pl. 47. Frentzel, sc.)** Size, 26 inches by 20; scale, 66' to 1 inch.

**AUSTRALIA.**

**BETTS.**—Australasia (the London series of Sixpenny Maps). Betts. 1846. Size, 15 inches by 17; scale, 350' to 1 inch.

**REINECKE.**—General Charte von Australien. Von J. C. Reinecke, im Jahre 1806, von neuen berichtet im December, 1812. Weimar. Size, 19 inches by 25; scale, 6' to 1 inch.

*New South Wales—*

**BETTS.**—The Gold Regions of New South Wales. (Betts.) Size, 15 inches by 12.

**GRIMES AND FLINDERS.**—A Topographical Plan of the Settlements of New South Wales, including Port Jackson, Botany Bay, and Broken Bay, surveyed by Messrs. Grimes and Flinders. Also a Sketch of Mr. Evans's Route west of the Blue Mountains in 1813-14. London, 1799-1815. Size, 22 inches by 28; scale, 2½' to 1 inch.

**OXLEY.**—A Chart of part of the interior of New South Wales. By John Oxley, Surveyor-General. London, 1825. Size, 54 inches by 40; scale, 13' to 1 inch.

**VAN DIEMEN'S LAND.**

**ARROWSMITH, A.**—Chart of Van Diemen's Land and Bass Strait. By A. Arrowsmith. London, 1833. Size, 34 inches by 26; scale, 11' to 1 inch.

**ARROWSMITH, J.**—Van Diemen's Land. By John Arrowsmith. London, 1834. Size, 25 inches by 21; scale, 9' to 1 inch.

**NEW ZEALAND.**

**BECKER.**—Map of the Colony of New Zealand from Official Documents. Engraved by the Omnigraph, by F. P. Becker and Co. London. Size, 17 inches by 14.

*New Plymouth—*

**CARRINGTON.**—Plan of the Town and part of the Settlement of New Plymouth. New Zealand. Selected, surveyed, and delineated by F. A. Carrington, &c. Size, 22 inches by 32; scale, 4 inches to 1 English mile.

— Plan of Manu-Kori Pah, &c., New Plymouth, N.Z. By F. A. Carrington. 1840-46. Size, 38 inches by 28.

**AFRICA.**

**GENERAL MAPS.**

**BERGHAUS.**—Bergketten und Fluss-systeme in Afrika. Von Dr. H. Berghaus. Gotha, 1850. Size, 10 inches by 8; scale, 15" to 1 inch. With letterpress in German, 24 pages, 4to.



BERTHE.—Nouvelle Carte d'Afrique. Par L. H. Berthe. Paris, 1829. Size, 22 inches by 31; scale, 210' to 1 inch.

BRÜÉ.—Carte Physique et Politique de l'Afrique. Par A. H. Brûé. Paris, 1822. Size, 24 inches by 35; scale, 210' to 1 inch.

CARY.—New Map of Africa, exhibiting its Natural and Political Divisions, &c. (By Cary.) London, 1819. Size, 36 inches by 33; scale, 150' to 1 inch.

HERISON.—Karte der regenschaften Algier, Tunis, und Tripolia, und des Kaiserthums Fez und Marokko, nebst den gegenüberliegenden europäischen Küstenstrichen. Von Herison, Geogr. 1841, Carlsruhe. Size, 25 inches by 36; scale, 40' to 1 inch.

MACQUEEN.—Map of Africa, from Loando in the South to Tripoli in the North, on Mercator's projection. By James Macqueen. London, 1840. Size, 26 inches by 38; scale, 115' to 1 inch.

REINECKE.—Charte von Africa. Von J. C. M. Reinecke. Weimar, 1812. Size, 21 inches by 24; scale, 4° to 1 inch.

SCHMIDT.—Africa gezeichnet von J. M. F. Schmidt. Berlin, 1819. Size, 21 inches by 24; scale, 4° to 1 inch.

SCHRAEML.—Karte von Africa verfasst von Herrn Robert Vaugondy, Geographen des Koenigs von Polen, neu herausgegeben von Herrn F. A. Schraembl. 1787. On four sheets. Size of each, 20 inches by 22; scale, 123' to 1 inch. (The two North sheets only.)

SEGATO.—Carte de l'Afrique Septentrionale, rédigée et gravée par Jérôme Segato. Florence, 1830. Size, 22 inches by 34; scale, 95' to 1 inch.

Africa nach Robert Vaugondy, Rennell's und Sotzmann's Skizze, &c. Nuremberg, 1794. Size, 22 inches by 24; scale, 220' to 1 inch.

## ALGERIA.

CARETTE.—Carte spéciale du Royaume d'Alger. Paris. Size, 13 inches by 21; scale 37' to 1 inch.

——— Carte Orographique de l'Algérie, par MM. Carette et Renou. 1844. Size, 19 inches by 28; scale, 1:2,000,000.

——— Carte de l'Algérie divisée par tribus. Par MM. E. Carette et Aug. Warnier. Paris, 1846. Size, 30 inches by 45; scale, 14' to 1 inch.

FRENCH GOVT.—Carte de la Province d'Alger, dressée au Dépôt de la Guerre. Paris, 1844. Size, 23 inches by 36; scale, 1:400,000, or 5½' to 1 inch. Two copies.

ROCHE, DE LA.—Carte des Divisions Politiques, Administratives, et Militaires de l'Algérie. Par Ch. de la Roche, attaché au Ministère de la Guerre. Paris. 1852.

*Constantine—*

FRENCH GOVT.—Carte de la Province de Constantine, dressée au Dépôt Général de la Guerre. Paris, 1844. Size, 23 inches by 36; scale, 1:400,000, or 5½' to 1 inch.

*Kabília—*

CARETTE.—Kabille, proprement dite. Par E. Carette. Paris, 1847. Size, 24 inches by 36; scale, 1:200,000.

*Oran—*

BOUFFARD.—Province d'Oran. Partie du Territoire de Colonisation, dressée par L. Bouffard. Avec indication de la nature des Terrains, d'après le Dr. Aug. Warnier. Paris, 1847. Size, 20 inches by 26; scale, 1:200,000.

FRENCH GOVT.—Carte de la Province d'Oran, dressée au Dépôt Général de la Guerre. Paris, 1844. Size, 43 inches by 36; scale, 1:400,000, or 5½' to 1 inch.

EGYPT.

ARROWSMITH, A.—A Map of Lower Egypt, from various surveys, communicated by Major Bryce and other officers. Drawn by A. Arrowsmith. London, 1807. On four sheets. Size of each, 25 inches by 32; scale, 2½' to 1 inch.

—Map of Upper Egypt, by A. Arrowsmith. London, 1807-1816. Size, 40 inches by 27; scale, 9' to 1 inch.

D'ANVILLE.—*Egyptus Antiqua*. Auctor D'Anville, 1765. London, 1812. Size, 20 inches by 13; scale, 27' to 1 inch.

FRENCH GOVT.—Carte Topographique de l'Egypte et de plusieurs parties des Pays limitrophes, levée pendant l'expédition de l'Armée Française par les Ingénieurs-Géographes, les Officiers du Génie Militaire, et les Ingénieurs des Ponts et Chaussées, assujettie aux observations des Astronomes, construite par M. Jacotin, Colonel au Corps Royal des Ingénieurs-Géographes Militaires, &c., gravée au Dépôt de la Guerre, à l'échelle de 1:100,000. Paris, 1818? On forty-seven sheets; also the following seven extra sheets:—1. Titre; 2. Noms des Ingénieurs; 3. Tableau d'Assemblage; 4. Isthme de Soneys; 5. Environs de Soneys; 6. Ile de Roudah; 7. Canal des deux Mers. Also Carte Géographique de l'Egypte et des Pays environnans, réduite d'après la Carte Topographique, &c., on three sheets. The whole in five cases, uniform.

JOMARD.—Esquisse d'une Carte Itinéraire (d'Egypte) pour les Voyages de M. F. Caillaud de Nantes, &c. Par M. J. Paris, 1822. Size, 15 inches by 13; scale, 110' to 1 inch.

LEAKE.—Map of Egypt, by Lieut.-Col. W. M. Leake, R.A., LL.D. &c. London, 1818. Size, 51 inches by 31; scale, 9½' to 1 inch. Two copies.

L.—, M. E. J. D.—Carte comprenant le Pays de Nedjd ou Arabie Centrale, l'Egypte, et partie des autres régions occupées en 1820 par les troupes de Mohammed-Aly. Pour servir à l'intelligence de l'histoire de l'Egypte sous le gouvernement de Mohammed-Aly. Par M. E. J. D. L. Paris, 1823. Size, 18 inches by 23; scale, 55' to 1 inch.

MESTELLE, &c.—Carte Physique et Politique de l'Egypte. Par E. Mentelle et P. G. Chanlaire. Paris, an VII. (1799.) Size, 20 inches by 24; scale, 27' to 1 inch. Two copies.

Carte Ancienne et Comparée de la Basse Egypte. Without title. Size, 18 inches by 27; scale, 7' to 1 inch, or 1:500,000.

Les Déserts d'Egypte, de Thébaidé, d'Arabie, de Sirie, &c.: où sont exactement marqués les lieux habités par les Saints Pères des Déserts. Paris, 1693. Size, 23 inches by 32.

Carte Hydrographique de la Basse Egypte; Carte dressée d'après les opérations des Astronomes et des Ingénieurs de l'Armée d'Orient, pour servir au Mémoire sur le Canal des deux Mers. Size, 25 inches by 35; scale, 1:400,000.

Plan of the operations of the British and Ottoman Forces in Egypt in 1801. London, 1802. Size, 36 inches by 18; scale, 1 Eng. mile to 1 inch. Two copies.

*Alexandrie—*

Plan Général des deux Ports, de la Ville moderne, et de la Ville des Arabes. Levé par les Ingénieurs de l'Armée d'Orient. Size, 24 inches by 35; scale, 260 mètres to 1 inch.

*Cairo—*

SIMONET, &c.—Le Kaire: Plan particulier de la Ville. Levé par MM. Simonet, Jomard, &c. Size, 26 inches by 40; scale, 65 mètres to 1 inch.

MAROCCHO.

RENOU.—Carte de l'Empire de Maroc. Par E. Renou, Membre de la Commission Scientifique d'Algérie. 1844. Size, 25 inches by 35; scale, 1:2,000,000.



# SENEGAL.

DE L'ISLE.—Carte de l'Afrique Française, ou du Sénégal. Ouvrage posthume de G. De l'Isle, &c. Paris, 1780. Size, 19 inches by 23; scale, 40' to 1 inch.

# SUDAN.

Aperçu des Découvertes du Dr. Oudney, du M. Denham, et du Lt. Clapperton en 1823. Size, 11 inches by 9; scale, 220' to 1 inch. In a case with Maps of Egypt.

# SOUTH AFRICA.

ARROWSMITH, A.—South Africa. By A. Arrowsmith. 1815. Size, 25 inches by 39; scale, 26' to 1 inch.

ARBOUSSET.—Carte du Voyage de MM. les Missionnaires T. Arbousset et F. Daumas au Nord des Bassoutos. 1836. Size, 10 inches by 14; scale, 38' to 1 inch.

DAUMAS.—Carte du Pays compris entre les deux Stations Missionnaires Françaises de Mekuattling et de Molito établies chez les Béchuanas (Afrique Méridionale); dressée par M. F. Daumas. 1840. Size, 11 inches by 16; scale 20' to 1 inch.

GALTON.—Map of Damara and the adjacent Countries, as explored and surveyed by Francis Galton, Esq. London, 1853. Size, 7 inches by 16; scale, 60' to 1 inch. With a rough sketch of Africa, &c.

# NORTH AMERICA.

AM. ETHNOL. SOC.—Tracings from the Transactions of the American Ethnological Society. Vol. 2:—Map of the Sites of the Indian Tribes of North America, when first known to the Europeans about 1600 A.D. along the Atlantic, and about 1800 A.D. on the Pacific. Size, 16 inches by 17. Ethnographical Map of Oregon, from Hale's Ethnology of the American Exploring Expedition. Size, 9 inches by 11. Map of the Valleys of the Rio Grande and Rio Gila, compiled from the Surveys of Col. Emory and Lieut. Abert, &c., by E. G. Squier. Size, 9 inches by 11.

ARROWSMITH, A.—Map exhibiting all the new discoveries in the interior parts of North America, inscribed to the Hon. Gov. and Comp. of Adventurers of England trading into Hudson's Bay. By A. Arrowsmith. London, 1795-1802. On six sheets, in two parts. Size, 49 inches by 39; scale, 60' to 1 inch.

MANNERT.—America nach der zweyten Ausgabe, &c. Von C. Mannert. Nuremberg, 1796. Size, 21 inches by 21.

SCHRAEMBL.—General Karte von Nord America samt den West Indischen Inseln. Verfasst von Herrn Pownall, neu herausgegeben von Herrn F. A. Schraembl. 1788. On four sheets. Size of each, 21 inches by 24; scale, 73' to 1 inch.

STREIT.—Charte von America. Von F. W. Streit. Weimar, 1810. Size, 24 inches by 20.

# BRITISH AMERICA.

BIGSBY.—Map to accompany Dr. Bigsby's Paper on the Geography and Geology of Lake Huron. (Geol. Trans.) Size, 16 inches by 18.

BOUCHETTE.—\* \* \* Lower and Upper Canada, Nova Scotia, New Brunswick, Newfoundland, and Prince Edward's Island, with a large section of the United States. By Joseph Bouchette, Jun., Deputy-Surveyor-General of the Province of Lower Canada. Size, 39 inches by 75; scale, 12' to 1 inch.

FEATHERSTONHAUGH.—Map of that portion of H. M. Colonies of New Brunswick and Lower Canada, the Title to which is disputed by the Government of the United States, etc. By F. D. Featherstonhaugh. 1839. Size, 14 inches by 18.



**HOLLAND.**—A New Map of the Province of Lower Canada, etc., compiled from Plans deposited in the Patent Office, Quebec. By Samuel Holland, Esq., Surveyor-General. London, 1835. Size, 24 inches by 36; scale,  $10\frac{1}{2}'$  to 1 inch. Another copy, 1839.

**RIDOUT.**—Map of the Province of Upper Canada and the adjacent Territories in North America. Compiled by James G. Chewett, Assistant-Draftsman under the direction of Thomas Ridout, Esq., Surveyor-General, London, 1830? In three parts. Size of each, 40 inches by 24; scale, 7' to 1 inch.

**WYLD.**—Map of the Province of Upper Canada, etc. James Wyld. London, 1838. Size, 24 inches by 36; scale, 19' to 1 inch.

**Diocese of Rupert's Land (Hudson's Bay Comp. Territory).** Size, 10 inches by 15; scale,  $142'$  to 1 inch.

### UNITED STATES.

**BRUÉ.**—Carte Générale des Etats-unis Mexicaines et des Provinces Unies de l'Amérique Centrale. Rédigée par Brué, Géographe. Paris, 1825. Size, 21 inches by 15; scale,  $130'$  to 1 inch.

— Nouvelle Carte des Etats Unis, des Haut et Bas Canada, de la Nouv. Ecosse, du N. Brunswick, de Terre Neuve, &c. Par A. H. Brué, revue et augmentée par Ch. Picquet. Paris, 1839. Size, 26 inches by 38; scale,  $57'$  to 1 inch.

**MITCHELL's Reference and Distance-Map of the United States.** By J. H. Young. Philadelphia, 1839. On 9 sheets. Size of each, 18 inches by 26; scale,  $22'$  to 1 inch.

**MURPHY.**—United States. Engraved by W. Murphy. Edinburgh. Size, 21 inches by 18; scale,  $36'$  to 1 inch.

#### *Carolina—*

**S.**—Carte particulière de la Caroline. Par le Sieur S \* \* \*. Amsterdam, Size, 20 inches by 24; scale,  $24\frac{1}{2}'$  to 1 inch.

**S.**—Carte Générale de la Caroline. Par le Sieur S \* \* \*. Amsterdam. Size, 23 inches by 19; scale,  $21'$  to 1 inch.

#### *Champlain L.—*

**BRASSIER.**—A Survey of Lake Champlain, including Lake George, Crown Point, and St. John, surveyed by order of H. Ex. Major-General Sir Jeffery Amherst, etc., by William Brassier. 1762. London, 1776. Size, 27 inches by 20; scale,  $5\frac{1}{2}'$  to 1 inch.

#### *Mississippi R.—*

**Map of the Country drained by the Mississippi; also, Profile or Vertical Section of the Country on the parallel of  $38^{\circ}$  N. lat.** London, 1823. Size, 16 inches by 21; scale,  $66'$  to 1 inch.

#### *Pennsylvania—*

**HOWELL.**—Map of the State of Pennsylvania. By Reading Howell. 1792. London. On 4 sheets. Size of each, 19 inches by 32; scale  $4\frac{1}{2}'$  to 1 inch.

**Vertical Section on the parallel of Latitude  $41^{\circ}$  N., intended as a continuation of Maclure's Third Section from the Sea-shore to the Alleghanies; also, Vertical Section on the  $35^{\circ}$  N., intended as a continuation of Maclure's Fifth Section.** London, 1823. Size, 8 inches by 12.

### MEXICO.

**ARROWSMITH, A.**—A New Map of Mexico and adjacent Provinces. By A. Arrowsmith. 1810. Size, 52 inches by 64; scale,  $33'$  to 1 inch.

CARY.—Mexico. By John Cary, London. Size, 12 inches by 10; scale, 170' to 1 inch.

Map of the Mining District of Mexico. Size, 17 inches by 24; scale, 37' to 1 inch.

#### CENTRAL AMERICA.

Bay et Château de Porto Bello. Size, 9 inches by 13.

#### WEST INDIES.

ARROWSMITH, A.—Chart of the West Indies and Spanish Dominions in North America. By A. Arrowsmith, 1803. On 4 sheets. Size, 50 inches by 57; scale, 39' to 1 inch.

##### CUBA.

SPANISH GOVERNMENT.—Carta Geog. Topografica de la Isla de Cuba, dedicada a la Reyna nuestra Señora Doña Isabel II., el Teniente General Conde de Cuba, y la comision de cefes y oficiales militares y de agrimensores públicos, que la levantó y formó de su orden en los años de 1824 a 1831. D. Estruch lo grabó en Barcelona, 1835. On 6 sheets. Size of each, 50 inches by 27; scale, 4½' to 1 inch.

*Havana*—

Baye et Ville de Havana ou S. Christoval. Size, 9 inches by 13.

##### MARTINIQUE.

C—, J.—La Martinique, dressée par J. C., Ingénieur. Size, 20 inches by 26; scale, 2' to 1 inch.

MONNIER.—Carte Générale de la Martinique. Dressée pour la partie Topographique d'après la Carte levée en 1763-66 par les Ingénieurs des Camps et Armées, et pour la partie Hydrographique, d'après les travaux exécutés en 1824 et 1825. Par M. Monnier, etc., au Dépôt Général de la Guerre, en 1831. Size, 57 inches by 25; scale, 1' to 1 inch. (2 copies.)

STE. CROIX.—Carte dressée pour la Statistique de la Martinique. Par le Marquis de Ste. Croix. 1822. Size, 19 inches by 24; scale, 2' to 1 inch.

Martinico, one of the Caribbee Islands in the West Indies, subject to the French. Size, 11 inches by 14.

##### ST. DOMINGO, OR HAYTI.

LEYRITZ, ETC.—Carte Politique de St. Domingue. Par MM. Leyritz, Levassor, and Bourjolly, Colons-Propriétaires. An XI. (1803.)

Isle of St. Domingo, or Hispaniola. London, 1796. Size, 19 inches by 30; scale, 12½' to 1 inch.

Geographisch-statistische und historische Charte von Hayti. Weimar, 1824. Size, 19 inches by 20; scale, 21' to 1 inch.

##### ST. EUSTATIUS.

FADEN.—The Island of St. Eustatius, corruptly St. Eastatia. Engraved from the original in possession of Le Marquis de Bouillé, by W. Faden. Size, 19 inches by 22.

#### SOUTH AMERICA.

ROCHETTE, DE LA.—Columbia Prima, or South America, in which it has been attempted to delineate the extent of our knowledge of that Continent. Extracted chiefly from the original manuscript Maps of H. Ex. the late Chevalier Pinto; likewise from those of J. J. da Rocha; J. da Costa

Ferreira, El Padre F. M. Sobreviela, &c. Digested and constructed by the late eminent and learned Geographer Louis Stanislaus D'Aray de la Rochette. London, 1807. On 8 sheets. Size of each, 25 inches by 34; scale, 43' to 1 inch.

SPIX AND MARTIUS.—General-Charte von Süd-America. Carte Générale de l'Amérique Méridionale en deux grandes feuilles, d'après les Observations et les Cartes spéciales, rapportées du Voyage dans l'intérieur du Brésil pendant les années 1817-1820. Par les Docteurs de Spix et de Martius. Munich, 1825. In 2 parts. Size of each, 32 inches by 43; scale, 70' to 1 inch.

PENTLAND.—La Laguna Titicaca and the Valleys of Yucay, Collao, and Desaguadero, in Peru and Bolivia. From Geodesic and Astronomic Observations made in the years 1827-28-37-38, by J. Pentland, Esq., H. M. Consul General to the Republic of Bolivia. London, 1848. Size, 27 inches by 43; scale 16' to 1 inch.

# BRAZIL.

CARY.—Brazil. By John Cary. London, 1810 (?). Size, 12 inches by 10; scale, 250' to 1 inch.

ESCHWEIGER, ETC.—Karte von Ost-Brasilien. Carte Géographique de la Partie Orientale de l'Empire du Brésil, en quatre feuilles contenant les Provinces Maritimes de Pernambuco jusqu'à Rio de Janeiro, celle de Minas Geraes, et une partie des Provinces limitrophes, etc. Par G. de Eschwege et Ch. F. P. de Martius, dressée par J. Schwarzmann. Munich, 1834. On 4 sheets. Size of each, 20 inches by 19; scale, 27' to 1 inch.

Bermeio R.—

SCALZI, N. DE.—Plano del Rio Bermeio desde su confluencia con el Negro en la Provincia de Salta hasta su desagüe en el Paraguay, &c. Levantado por Dr. Nicolas de Scalzi, Piloto Director del Viage, etc. Buenos-Aires, 1831. Size, 26 inches by 22; scale, 14' to 1 inch.

Clará—

SCHWARZMANN.—Carte Géographique de Clará, Province de l'Empire du Brésil, rédigée d'après une Carte manuscrite levée en 1817 par ordre du Gouverneur, M. J. de Sampaio, par Anton José de Silva Paulet, et d'après les Observations et les Cartes maritimes du Baron Roussin. Par M. J. Schwarzmann et M. le Chev. de Martius. 1831. Size, 11 inches by 11; scale, 36' to 1 inch.

Madeira R.—

Das obere Stromgebiet des Rio Madeira, nebst den angränzenden Ländern. Size, 10 inches by 11; scale, 70' to 1 inch. (Als Carton zur General-Karte von Süd America, München, 1825, zu gebrauchen.)

Piauhý—

SCHWARZMANN.—Carte Géographique de Piauhý, Province de l'Empire du Brésil, rédigée d'après les Cartes manuscrites de José Pedro Cezar de Menezes et M. J. da Silva Pereira. Par M. J. Schwarzmann et M. le Chev. de Martius. Munich, 1828. Size, 18 inches by 15; scale 36' to 1 inch.

Rio de Janeiro—

MAHLMANN.—Karte der Provinz Rio de Janeiro. Vornehmlich nach den Karten von Freycinet, v. Spix u. v. Martius, der 1830 in Mannheim erschienenen, u. der Karte v. P. Taubois (Rio de Jan., 1839, 4 Bl.) so wie nach den Reisebeschreibungen von v. Eschwege, Prz. Maximilian v. Neuwied, v. Spix u. v. Martius, Pohl, A. St. Hilaire, und dem Dictionario Geographico v. Milliet Lt. Adolphe (Paris, 1854), bearbeitet von H. Mahlmann. Berlin, 1848. Size, 8 inches by 13; scale, 18½' to 1 inch, or 1:1,333,333.

# COLUMBIA.

BAUÉ.—Carte de Colombie, etc. Par A. H. Baué. Paris, 1823. Size, 15 inches by 21; scale, 93' to 1 inch.



## ATLANTIC ISLANDS.

### CANARY ISLANDS.

#### *Lanzarotte I.—*

BUCH, L. DE.—Lanzarotte von Leopold von Buch. Gestochen von Carl Mare in Berlin. 1820. Size, 12 inches by 14; scale, 3' to 1 inch.

#### *Palma I.—*

BUCH, L. DE.—Carte Physique de l'Isle de Palma. Par Leopold de Buch. 1814. Gravé par P. Tardieu. Paris, 1824. Size, 18 inches by 13; scale, 3' to 1 inch. (2 copies.)

#### *Tenerife I.—*

BUCH, L. DE.—Carte Physique de l'Isle de Tenerife, levée sur les lieux par Leopold de Buch en 1814. Paris, 1831. Size, 25 inches by 31; scale 2' to 1 inch.

### FALKLAND ISLANDS.

EDGAR.—Chart of West Falkland Island, from an actual Survey by Lieut. Thomas Edgar, R.N. London, 1831. Size, 25 inches by 31.

### MADEIRA.

JOHNSTON.—Geo-Hydrographic Survey of the Isle of Madeira, with the Dezertas and Porto Santo Islands, geometrically taken in the year 1788. By William Johnston, Esq. Size, 24 inches by 31; scale, 2½' to 1 inch.

### ST. HELENA.

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Ziegler, J. M., Esq., *Cor.* F.R.G.S.

# NOTICE.

The "Proceedings" of the Society are now published separately, and sent to the Fellows *free of expense*.



PRESENTATION  
OF THE  
ROYAL AWARDS

TO ELISHA KENT KANE, M.D.; TO HEINRICH BARTH, PH.D.,  
AND TO CORPORAL CHURCH, *of the Royal Engineers.*

HIS EXCELLENCY G. M. DALLAS, Minister of the United States of America, having consented to receive the Gold Medal awarded to Dr. Kane, the President addressed him as follows:—

“ Sir,—The Founder’s Gold Medal, the highest honour this Society has in its power to bestow, has been awarded to Dr. Kane, of the United States of America, for his distinguished services and important discoveries in the Polar regions, while in charge of the expedition fitted out in America to search for Sir John Franklin; and for his valuable Memoir and Charts, communicated through the Admiralty.

“ In the absence of Dr. Kane himself, I could desire no greater privilege than that of confiding the award, Dr. Kane has so justly deserved, to the hands of the distinguished representative of the nation to which he belongs; in order that the feeling of this Society, and I may say of the country at large, may go forth in its fullest extent to the land which enrols the name of Dr. Kane among her citizens. Sir, I cannot discharge this duty without passing a remark on the peculiarity of the circumstances attending this occasion.

“ It seldom happens that nations so distantly situated, spontaneously unite in such acts of humanity as those which have characterized the late search for Sir J. Franklin. More rarely still do we find the sympathies of individuals so enlisted in the fate of foreigners, as to manifest themselves in acts of philanthropy of such a truly liberal and substantial character as have here occurred; and this act of the United States, together with the names of Grinnell and Peabody, will long be remembered in this country, even after the spirit of Arctic enterprise shall have passed away. But, Sir, if the feelings of *nations* have been deeply enlisted in this search, how much more so must have been the feelings of *individuals*, who enjoyed the friendship of the object of it? Sir, there are persons now present who were early associated with our lamented countryman, who shared with him his first perilous encounter with that icy element which was afterwards to become his tomb, and who enjoyed his friendship through life.

"As one of these, you may imagine that it is with no small degree of interest that I find myself now, in my official capacity, conveying this award of the Society, to the officer who so strenuously endeavoured to determine the fate of him, whom we all so deeply deplore.

"These sympathies, however, have had no share in the decision of the Council. Dr. Kane's merits alone, have won for him this testimony of the Society; and I trust that these reciprocal acts of good feeling between nations and individuals may tend to bind in lasting ties of amity these two great nations, whose sympathies have been shown to be so closely identified."

His Excellency the American Minister, having received the Medal, replied:—

"Mr. President,—On behalf of my fellow-citizen, Dr. Elisha Kent Kane, I receive, with equal pride and pleasure, this testimonial, awarded by your learned body, to his ability and services in that branch of human knowledge, to which you are specially devoted.

"His country also, even now engaged in expressing her high sense of his deserts, will be gratified to learn that her judgment, which might, possibly, be ascribed to partiality, has been thus sanctioned.

"Young as he yet is, and fairly entitled to count upon many years of zealous intellectual activity, he can never achieve a prouder recognition, considered in all its aspects, than this Medal of the Royal Geographical Society of London.

"Dr. Kane, as is personally known to me, entered upon his career of Arctic exploration under the influence of sentiments which were strengthened, rather than shaken, by its depicted terrors. In the medical department of the navy of the United States, on a remote station, his Government scarcely intimated a disposition to join in the search for Sir John Franklin, before he hurried forward to volunteer an enlistment for that noble purpose. There was a voice upon the breeze that had caught his ear; an ardent fondness for scientific studies impelled him to a fresh field of research; a daring and irrepressible spirit of enterprise co-operated with much experience and peculiar attainments. He went—he went twice; and, though he vainly offered his own life to rescue another's, he brought back with him observations, verifications, discoveries, and delineations, worthy to be accepted by the masters of geographical science. If, as I believe was the case, he penetrated to and actually beheld the ice-encircled yet open sea, whose existence had been predicated of the periodical northern flight of aquatic birds, of certain currents, and of other *indicia*, he may justly feel that the practical solution of an interesting problem has earned the honour of your approbation.

"I do not wish, Mr. President, to eulogise my countryman. You are far more competent than myself to appreciate the exact value of what he has effected. Your Council have affixed to his record this their Great Seal; and at your invitation, and with alacrity, I assume the grateful task of transmitting it safely to his hands."



The President then addressed Dr. Barth, who was present, in the following words :—

“ Sir,—The Patron's Gold Medal of this Society has been awarded to you ‘for your successful and extensive explorations in Central Africa, your numerous excursions about Lake Chad, your discovery of the great river Binné, and for your hazardous and adventurous journey to and from Timbuctú,’ by which you have afforded to us the first really authentic information respecting that important locality.

“ In conveying to you this testimony of the high sense entertained by this Society of the merit of your performances, I cannot overlook the important fact that it is just thirty-three years since I found assembled upon the shores of Africa, whence you started, the distinguished but lamented travellers Oudney, Clapperton, Denham, and Tyrwhitt, all bent upon the same great enterprise of opening out the interior of that continent; and although Laing, one of our countrymen, did afterwards succeed in reaching the famed Timbuctú, yet of all this party, and of those who attempted that great exploit, you alone stand upon our shores as the successful accomplisher of the enterprise.

“ If, Sir, the service performed be measured by the difficulty of accomplishment, evidenced by the lapse of time and by the loss of life that has occurred in this adventurous attempt, the award of our Medal must be acknowledged to be justly merited. But you have other performances to strengthen your claim; for we are informed that your labours have been so extensive, that the account of them will reach over five volumes of matter, which, collected in such a country, must prove of the highest import.

“ Sir, I congratulate you on the successful accomplishment of your undertaking, and trust that this high tribute will stimulate you to future enterprises.”

Dr. Barth replied :—

“ Mr. President,—It is with great pride and satisfaction that I am here to receive, at your hands, the Medal which the Council of the Royal Geographical Society has awarded to me; for nothing can be more gratifying to a man who, from love of science, has thrown himself into a dangerous and adventurous career, like that of a traveller in the inhospitable and turbulent regions of Central Africa, than the acknowledgment of such a distinguished body of learned and eminent men as the Council of the Royal Geographical Society. But it is not alone on my own behalf that I thank you; as a member to a foreign nation, who will be honoured by the distinction which this day you have conferred upon me, I offer you also their acknowledgments as well as my own grateful thanks.

I shall say nothing on the extent and purport of my discoveries, which have been fully appreciated by competent men, and will shortly be laid before the public in a full account of my Travels. May I only be allowed to express the hope that, after a great and



practicable high road into the heart of Africa has been found at length, with the sacrifice of the lives of so many noble, eminent, and daring men, and after it has been proved to be such by the successful voyage of Mr. Laird's steamer '*Pleiad*,' and after a considerable advance has been made in the knowledge of the interior of the continent, which shows it to be of a far richer character than has ever been supposed, Her Majesty's Government will not allow the opportunity to pass by, to establish, in a vigorous manner, legitimate commerce with those unfortunate regions, and thus hold out to the natives a humane and lawful way in which they may be able to supply their wants of foreign produce, without bringing, by slave-hunts and slave-trade, misery and desolation over wide and fertile districts.

"The present moment is the more important for such exertions, as, by the abolition of the slave-trade in the regency of Tripoli and in Fezzan, the trade of the interior has just been brought to a great crisis, and the people are obliged to look most anxiously about for a new channel by which they may supply their wants. The last news received from Dr. Vogel gives a new proof how extremely anxious the chiefs along the river Chadda or Binue are to enter into friendly relations with the English, but how continually they are disappointed. Certainly the commercial relations of the great western branch of that immense river, the so-called Niger, principally between Timbuctú and Sansandi, are far more developed; but the difficulties which attend the navigation of the lower part of that river, as well between the towns of Bousa and Yauri, as higher up the river between Tosaye and Kendaji, are considerable, although with the means which human genius has made available, they appear by no means insurmountable.

"I conclude, Mr. President, by repeating to you my grateful thanks for the distinguished honour conferred upon me this day."

Corporal Church having requested that Lieutenant-General Sir John Burgoyne would kindly do him the honour to receive the award of the Society on his behalf, the President addressed him as follows :—

"Sir John Burgoyne,—The Royal Geographical Society have awarded to Corporal Church this watch and chain, in acknowledgment of his meritorious and intelligent services while employed upon the African expedition under Dr. Vogel. It is the wish of the Society, especially to mark with approbation, his diligence in conducting a long series of meteorological observations at Kuka, and his ability in assisting Dr. Vogel in those observations, by which he has determined astronomically so many positions on his route.

"It will be satisfactory to you, Sir John, to learn that Corporal Church has amply sustained the high reputation of that excellent corps of Sappers and Miners, whose unassuming labours have so materially contributed to render the detail of the topographical survey of this country so perfect, and have so largely contributed towards the suc-

cess of other geographical undertakings. If anything can enhance the pleasure which I feel in the discharge of this duty, it is that of delivering this acknowledgment of the merits of a zealous and faithful soldier into the hands of so distinguished an ornament of the army, one whose high scientific knowledge and military experience have contributed so largely to the glory of this nation."

Lieutenant-General Sir John Burgoyne, accompanied by Corporal Church, after the delivery of the honorary award, said:—

"Mr. President,—I have not been prepared to take any part in this proceeding; but although unexpectedly called upon, I cannot refrain from expressing the gratification I feel, that any member of the corps to which I have the honour to belong, should be thought worthy of so flattering a mark of distinction as that now conferred. I can assure the Meeting, that the corps of Royal Engineers and Sappers are as ready to devote themselves to scientific enterprise, as they are for military service in the field.

"With regard to Corporal Church, I believe him to be a zealous, good soldier, a man of intelligence, and one who would be always anxious to carry out the orders or wishes of his superiors; and that he would never bring discredit on the marks of favour thus shown to him, by so distinguished a body as the Royal Geographical Society."

## A D D R E S S

TO THE

ROYAL GEOGRAPHICAL SOCIETY  
OF LONDON;*Delivered at the Anniversary Meeting on the 26th May, 1856,*BY REAR-ADMIRAL F. W. BEECHEY,  
V.P.R.S., F.R.A.S., &c.

PRESIDENT.

GENTLEMEN,—Before I address you upon the subject of the progress and condition of that science which we more immediately cultivate, I desire to convey to the Vice-Presidents and Members of the Council for the past year, my acknowledgment of the great assistance I have invariably received from them, especially during a long and serious illness. To them, and to the unremitting attention of our Secretary, is owing entirely the satisfactory conduct of the business of the Society during that period. How well your interests have been attended to, is manifest by the Report of the Council, in which you will find that, whilst the sphere of usefulness of the Society has been enlarged, its permanent fund has been increased, and the list of Members has been extended. You will have learned also that our map-room and library have been enriched by the receipt of the valuable collection of maps and books bequeathed to the Society by Mr. Greenough; to whose memory the Council have directed a marble bust to be executed and placed in a suitable part of the building, as a justly merited testimony of the high regard and respect the Society entertain for this eminent geographer. This extensive collection has been arranged for ready access, and embodied in the general catalogue, under the judicious management of the map-committee and our curator, Mr. Saunders.

You will have been made aware, by the receipt of the 'Proceedings,' that the Council have carried into effect their determi-



nation, conveyed to you at an evening meeting during the session, to issue this publication. They considered that such a work would be acceptable to the Members, and beneficial to the interests of the Society, as a means of conveying early notices of the papers read at the evening meetings, and of the discussions upon them; also as an additional means of readily disseminating geographical information to the Public, who are at liberty to purchase the numbers; and our thanks are due to Mr. Galton, and the Rev. Messrs. Clark and Nicolay, and to our Secretary, for the readiness with which they have undertaken the compilation and editorship. In starting a publication of this description, the Council have been careful to put on record the restrictions under which this work is to be published, that it may be kept within due control, and strictly confined to the object for which it was intended. I conclude this notice of our household matters with recording the gratifying fact that the obelisk to the gallant Bellot has been erected at Greenwich, and the fund distributed; and thus a great national testimonial has been raised to the memory of that devoted individual, and a benefit bestowed upon his family.

#### OBITUARY.

It is my painful duty to inform you that, during the past year, the list of Members who have passed away is unusually large. Among them are many names well known to science and to the world at large, of whose merits I can give little more than a very limited sketch.

In alphabetical order I have first to mention,

ADAMSON, John, Esq., one of the earliest Fellows of this Society, and a relative of the celebrated traveller, Sir Robert Ker Porter. Mr. Adamson was the last surviving son of Lieut. Cuthbert Adamson, R.N., who accompanied the Hon. Capt. Phipps, afterwards Lord Mulgrave, in 1773, as 2nd Lieutenant of the 'Racehorse,' in his voyage of discovery towards the North Pole. He was born September 13th, 1787, at Gateshead, and was sent at an early age to Lisbon. From his youth he was devotedly attached to the pursuits of literature, became a member of the Literary and Philosophical Society of Newcastle in 1811, and one of its secretaries in 1825, remaining in office up to the period of his death. Mr. Adamson's brief visit to Portugal in 1803 had left impressions on his mind which were never effaced, and gave him that taste for Portuguese literature which he retained during the remainder of his life. In 1820

appeared the work on which his fame chiefly rests—the *Memoirs of the Life and Writings of Camoens*, the merits of which have been appreciated at home and abroad. In 1836 he printed for private circulation, under the title of '*Bibliotheca Lusitana*,' a catalogue of the books in his library relating to Portugal—an interesting piece of bibliography.

Mr. Adamson's last literary work was a labour of love. He ushered into the world the first five cantos of the '*Lusiad*,' translated by his friend Mr. Quillinan, whose lamented death prevented him from completing the task he had imposed upon himself. He was also the editor of several of the publications issued by the Typographical Society of Newcastle. His literary correspondence extends over half a century, and includes letters from geographers, antiquaries, numismatists, naturalists, poets, men of letters and science, and other distinguished persons in various parts of the world. He was a corresponding member of the Royal Society of Northern Antiquaries at Copenhagen, of the Literary Society of Iceland, of the Royal Academy of Inscriptions, Belles Lettres, &c., at Stockholm, of the Royal Society of Literature of Courland, of the Royal Academy of Sciences of Lisbon, of the Archaeological Academy of Madrid, a member of the British Association for the Advancement of Science, as well as a Fellow of the Royal Geographical, the Linnean, and the Antiquarian Societies.

BARCLAY, Charles, Esq., F.S.A., formerly of Bury Hill, was the head of the world-known firm of Barclay, Perkins, and Co.

In 1815 Mr. Barclay was elected a member of Parliament for the borough of Southwark. He possessed a liberal and enlightened mind and a benevolent disposition. He was an active and intelligent magistrate for the county of Surrey, and a generous promoter of education. His death was occasioned by a fall from his horse.

BUCKINGHAM, James Silk, Esq., was born near Falmouth, in 1786. In his youth, he passed several years at sea, and also in a variety of occupations on shore; among which, his working as a compositor in printing offices proved of most influence on his career through life. He first became known in public affairs, by his attempts to open up the journalism of India. Mr. Buckingham first went to Calcutta about the year 1815, and always retained much interest in Indian affairs, and hailed with warm satisfaction the removal of the restrictions on the press in India, which the wise and liberal policy of Lords Metcalfe and William Bentinck at length effected. In 1825 he established in London a paper, the '*Oriental Herald*,' the pro-



cursor of the 'Athenæum,' and of various other journals. On his way to and from India, Mr. Buckingham travelled through different countries, and afterwards published narratives of his travels. In 1822 appeared 'Travels in Palestine;' in 1825, 'Arabia;' in 1827, 'Mesopotamia and adjacent Countries;' and in 1830, 'Assyria and Media.' At a later period, he made tours in various parts of Europe and North America, his account of the latter occupying no fewer than ten volumes, three devoted to the Northern States of the Union, three to the Slave States, three to the Eastern and Western States, and one to Canada, Nova Scotia, and New Brunswick. The European travels are described in two volumes on Belgium, the Rhine, and Switzerland. All these contain much valuable descriptive and statistical matter, the author having paid more attention than is usual with tourists, to the social condition of the countries which he visited. Mr. Buckingham was one of the most pleasing and instructive popular lecturers, especially in describing places which he had visited. In 1832, he was elected M.P. for Sheffield in the first reformed Parliament, and retained his seat till 1837. In his political life, he chiefly took an active part in questions affecting social reforms; and the temperance movement had in him a zealous advocate. In 1849, he published a volume, entitled 'National Evils and Practical Remedies,' in which he expounded his views on a variety of topics of public interest. Mr. Buckingham died on the 30th of June last, aged 69. His last work, published a few months before his death, was his 'Autobiography.'

CARR, Commander Washington, entered the navy in 1811, and in May, 1843, was appointed to the command, in the West Indies, of the 'Hermes' steam-sloop. Commander Carr was known as an amiable man and a sincere friend.

CHATTERTON, Sir William A., Bart., an early Fellow of this Society, died in August last, at Rolls Park, Essex. He was born in 1787, and was the second Baronet, a Deputy-Lieutenant of the county of Cork, a Vice-President of the Royal Literary Fund, a Fellow of the Zoological Society, and a member of the Imperial Academy of Sciences of St. Petersburg.

COLQUHOUN, the Chevalier James de, LL.D., &c., one of the earliest Fellows of this Society, was the only son of Dr. Patrick Colquhoun, late Lord Provost of Glasgow, one of the first who applied himself to the development of the statistics of the British empire. He founded and carried out the present system of Thames Police, whereby the mercantile interest is now so efficiently protected; and



suggested in his work on the Metropolitan Police, the adoption of an improved system for the protection of public property and of personal safety, subsequently carried out by the late Sir Robert Peel.

In 1800, he became the private secretary of Mr. Dundas, then the Secretary of State for the War Department; three years later, he received the appointment of Deputy Agent-General for the payment of volunteers. In 1817, the Hanseatic republics constituted him their representative here, and the legislatures of St. Vincent, Dominica, St. Christopher, Tortola, Tobago, Nevis, and the Virgin Islands, at different times nominated him to watch over their interests. In 1827, he was appointed Consul-General of the King of Saxony; and in 1848, his Royal Highness the late Grand Duke of Oldenburg appointed him his *Chargé d'Affaires*. He was Knight Commander of the first class of the Royal Saxon Order of Civil Merit. On the signature by Reshid Pasha, of a treaty of recognition between the Hanseatic republics, as their Plenipotentiary he received the Order of *Iftihar* of the first class from the Sultan; and the Hanseatic republics conferred on him the honorary diploma of citizenship, to which the Senate of Lübeck and Hamburg added their honorary medal. The University of Glasgow also conferred on him the honorary degree of LL.D.; and the Royal Antiquarian Society of Athens constituted him an honorary fellow. As Hanseatic Plenipotentiary he signed the commercial treaties with Great Britain, the Ottoman Porte, Mexico, and Liberia; and he also signed a treaty, as Saxon Plenipotentiary, with Mexico. He died on the 23rd of July, 1855, in the 76th year of his age.

ESTCOURT, Major-General J. B. Bucknall, died before Sebastopol last June, of that disease—cholera—which carried off so many of our brave countrymen, in his 53rd year. General Estcourt, educated at Harrow, entered the army as an ensign, and served in the expedition to the River Euphrates from 1836 to 1837; he was also employed on the American boundary question, and afterwards went out in 1854 on the staff of Lord Raglan, and served as Adjutant-General of the Forces, from the first landing in the Crimea, sharing the glories and dangers of Alma, Balaclava, and Inkermann. In 1848 he was elected a member of parliament for Devizes.

FRASER, James Baillie, Esq., of Reelick, Inverness, a Deputy-Lieutenant of that county, died in January last, in his seventy-second year. He was born in June, 1783, and was the eldest of four brothers, all remarkable men, sons of the late Edward S. Fraser. James Baillie went early in life to the West Indies; but

after a short residence there he resolved, like his brothers, to proceed to the East, whence he returned to this country, about the year 1822. Mr. Fraser again went to India, and was employed in a diplomatic mission, in the course of which he rode on horseback from Constantinople to Ispahán, the fatigues and hardships of which gave the first shock to his vigorous constitution. When the Persian princes visited this country, he was requested by Government to accompany and take charge of them; and on their return, he went with them as far as Constantinople. Latterly, Mr. Fraser became a zealous improver of his Highland estate, which is almost unequalled for its magnificent woods and romantic burn scenery.

In 1820, Mr. Fraser published a 'Tour through the Snowy Range of the Himalaya Mountains;' in 1825, a 'Narrative of a Journey into Khorasan in the Years 1821 and 1822, including an Account of the Countries to the North-East of Persia;' and in 1826, 'Travels and Adventures in the Persian Provinces.' In 1838, appeared his work, 'A Winter Journey from Constantinople to Tehrán, with Travels through various parts of Persia.' He wrote also a History of Persia, contributed various pieces to the *Annals*, and ventured once more into the regions of fiction by a Scottish story, 'The Highland Smugglers.' His last work was a military memoir of Colonel Skinner, a distinguished Indian officer, who died at Delhi in 1841, and was buried by the side of his friend William Fraser.

Mr. Fraser was as accomplished as an artist, as he was as an author. He was an exquisite painter in water-colours, and several of his drawings of Eastern scenes have been engraved.

HALL, Dr. George, was well known as an accomplished traveller, Elected, in 1822, a Radcliffe Travelling Fellow of Oxford, he went abroad, and, after visiting the greater part of Europe, joined the Count Alexander de la Borde, who, with his son Count Léon and the Duke de Richelieu, were about to travel in the East. Dr. Hall accompanied that distinguished party throughout the whole of their well-known journey through Egypt and Asia Minor, which gave him opportunities of visiting some parts of those countries then little known.

Whilst at Jericho he made an excursion to the ruins of the cities of Geraza and Amman, in the country E. of the Jordan, of which he printed an account in 1851, for private circulation. It is to be regretted that with the exception of a description of Azani, which appears in Colonel Keppel's 'Journey across the Balkan,' no other portions of his travels have as yet been published.



His varied and extensive knowledge and a most amiable disposition made his society always much sought after, and endeared him to a large circle of friends who will long deplore his loss.

HAMMOND, William, Esq., was elected a Fellow in the year 1838.

HARRIS, Captain Fortescue William, was born in 1821, educated at the Royal Naval School, and afterwards entered the merchant service. After many voyages to China, the East and West Indies, he was appointed to the command of the 'Madagascar' in 1852; went to Calcutta and back, and sailed on the 6th of March, 1853, for Melbourne, Victoria. He left Melbourne homeward-bound on the 12th of August the same year, since which time nothing has been heard of the crew or ship, which is supposed to have foundered while coming round Cape Horn.

IRVING, Edward George, M.D., R.N., was born 1st April, 1816, in the parish of Hoddam, Dumfriesshire, where he commenced his education and continued his studies for several years. He then went to the University of Edinburgh, and remained there until he obtained the degree of M.D. In 1840, he entered her Majesty's navy, and joined H.M.S. 'Britannia.' On the 14th October, 1840, he was appointed to H.M.S. 'Bellerophon,' Captain C. Austen, and was present at the siege of Acre. In August, 1841, he joined H.M.S. 'Isis,' Captain Sir John Marshall, on the Cape of Good Hope station, and remained in her three years. His next appointment was in 1845, to H.M.S. 'Tortoise,' for service on the Island of Ascension. He next volunteered into the 'Styx,' Captain Chads, and continued on the African coast until June, 1848, during which time fever prevailed to a great extent, and his own health suffered severely. He remained in England until May, 1850, when he again returned to the West Coast of Africa in H.M. steam-sloop 'Prometheus,' Captain Henry Foote; that officer having been ordered to proceed on a mission to Abbeokuta, Dr. Irving accompanied him thither; and on his return to England, in January, 1853, he wrote an account of their journey, which was published in the 'Church Missionary Intelligencer.'\*

The testimony of Captain Foote and Dr. Irving proved that the natives of Abbeokuta and the Yoruba tribe generally, are an enterprising, industrious, and tractable people, and that the effect of missionary labour had been, to turn their thoughts from war and kidnapping to peace and the pursuits of lawful commerce. They

\* Vide 'Church Missionary Intelligencer,' June, August, and October, 1853.—Ed.



had also entered into treaty with the English Government, and friendly relations had been established with the British consuls on the coast, as well as with her Majesty's cruisers engaged in the suppression of the slave trade.

In this state of things the missionaries were the only persons able to give the natives advice upon their political and commercial affairs; yet it was obviously desirable that, as religious teachers, they should be relieved as far as possible from such temporal cares; and for this purpose the Committee of the Church Missionary Society determined to send out a lay agent, who, while on friendly and confidential terms with the missionaries, might also be authorised to communicate with the Consul and naval officers, as well as with the Home Government, upon matters which may tend to promote British interests and commercial relations with the native tribes.

Dr. Irving's experience of nine years upon the West Africa coast, and the interest which he had taken in native civilisation and Christianity, pointed him out as a most eligible person for such an office. It was, therefore, proposed to him to go out for three years on this mission, and he readily acceded to the proposal. The Lords Commissioners of the Admiralty having granted the leave of absence, Lord Clarendon, as her Majesty's Secretary for Foreign Affairs, gave his sanction to the arrangement, and furnished Dr. Irving with letters of introduction to the consuls. Furnished by the Hydrographic Office and by this Society with instruments, with the use of which he had made himself perfectly acquainted, Dr. Irving proceeded to Africa in January, 1854, and diligently improved every opportunity for gaining the confidence of the natives, for promoting internal peace, and for inducing the chiefs to open and protect roads from various towns in the interior, to the coast. His period of labour was very short. He fell a victim to the climate after fifteen months' residence, and his death was deplored by all the native chiefs as a national calamity. His botanical collections have been sent to our learned associate, Sir William Hooker, at Kew.

KING, Philip Parker, Rear-Admiral of the Blue, F.R.S.—Admiral King, the son of Philip Gidley King, Esq., Post-Captain in the Royal Navy, was born at Norfolk Island on the 13th of December, 1793, and was consequently in the 63rd year of his age. In early life, when only in his sixteenth year, his gallant conduct in boat actions had obtained the favourable notice of the officers in command. In later years, he conducted a survey of the coasts of Australia, and subse-

quently of the southern coasts of America. In February, 1817, he was entrusted with the conduct of an expedition having for its object a survey of the coasts of Australia, a service on which he continued employed in the 'Mermaid,' cutter, and 'Bathurst,' sloop—to the command of which he was promoted by commission, dated 17th July, 1821—until his return to England in 1823. The results of the undertaking are contained in a Narrative of the Survey of the Inter-tropical and Western Coasts of Australia, and in an Atlas, both compiled by Captain King, and published, the former by Murray, and the latter by the Hydrographic Office of the Admiralty. In September, 1825, from the feeling of confidence with which he had impressed the Admiralty, in the discharge of his late duties, he was appointed to the 'Adventure,' sloop, and ordered to survey the southern coast of America, from the entrance of the Rio de la Plata round to Chiloe, and that of Tierra del Fuego. He was paid off on his arrival in England, 16th November, 1830, and has not been since employed. His post commission bears date 25th February, 1830.

In 1832, Captain King published, as the partial fruit of his recent voyage, a volume entitled, 'Sailing Directions to the Coasts of Eastern and Western Patagonia, including the Straits of Magellan, and the Sea Coast of Tierra del Fuego.'

On his retirement from active service, Captain King returned to Australia, and shortly after his arrival, succeeded Sir Edward Parry as manager of the affairs of the Australian Agricultural Society, the duties of which office he discharged with characteristic and exemplary ability and attention for several years. He was appointed a nominee member of the Legislative Council by the governor, Sir Charles FitzRoy; but latterly he held his seat in the House in the more honourable capacity of a representative member, having, at the general elections of 1851, offered himself as a candidate for the constituency of Gloucester and Macquarie, and on that occasion was returned by a large majority over his opponent, Mr. Joseph Simmons. During the last session of Council, he strongly supported, in particular, the proposition for the establishment of a nautical school. For some time past he held the office of chairman of the Denominational Board of Education, and was consequently regarded as the representative of that body in the Council.

His was the first instance of a native of Australia rising to so distinguished a rank in the British navy, and every one must feel a deep regret that his enjoyment of the honour was for so brief a period.



Both in public and in private life, Admiral King merited, as he obtained, the cordial regard and high respect of all to whom he was known, whether personally or by repute.

LAWRENCE, the Hon. Abbott, who died at the age of 63, was the fifth son of Samuel Lawrence, and was born in Groton, Massachusetts, became a member of the Common Council of Boston in 1831, and in 1834 was elected to Congress, and served the term. He declined a re-election, but consented in 1839 to be a candidate to fill the vacancy caused by the resignation of Richard Fletcher, was elected, and took his seat in the House in December of that year. Upon his entrance into Congress he was put on the Committee of Ways and Means.

Mr. Lawrence, in 1842, was appointed a commissioner on the part of Massachusetts, to arrange the North-Eastern Boundary Question, and rendered most efficient service. In 1849, he was invited by General Taylor to take a seat in his Cabinet. He declined the offer, but accepted the appointment of Minister to Great Britain, the duties of which office he performed honourably to himself, satisfactorily to this, and advantageously to his own country. Mr. Lawrence was public spirited, liberal, charitable, and benevolent. In all schemes of public improvement he took a deep interest, and aided them with his hand and purse. His foundation of the Lawrence Scientific School, at Cambridge, by a gift of 50,000 dollars, and the bequest of an additional 50,000 dollars in his will, his establishing prizes for the deserving scholars of the public schools, and the aid always generously given by him to churches and to religious and charitable associations, are well known.

LOCH, James, Esq., died last July at his residence in Albemarle-street, aged 75. He was an Advocate and Barrister-at-Law, and Fellow of the Royal Geographical, Geological, Statistical, and Zoological Societies of London; formerly M.P. for the Kirkwall and Wick district of burghs.

Mr. Loch was the author of a 'Memoir of George Granville, late Duke of Sutherland,' 4to. 1834; and his second son was the late Captain G. G. Loch, R.N., F.R.G.S., Surveyor of the River San Juan de Nicaragua, and author of 'The Closing Events of the Campaign in China,' 1843, 8vo.

MITCHELL, Colonel Sir Thomas L., D.C.L., F.R.S., Surveyor-General of New South Wales, and one of the earliest members of this Society, died in October last, aged 63. He joined the army in the Peninsula when only sixteen, served on Wellington's staff to the close of



the war, and was subsequently sent back to survey the battle-fields of the Peninsula. His model of the Lower Pyrenees is in the United Service Museum. In 1827, he was sent to survey Eastern Australia, having the appointment of Deputy Surveyor-General. A report of all his surveys is to be published by the Australian Legislature. Sir T. Mitchell made several exploring expeditions into the interior of the country, of which valuable narratives have been published.

In Australia, the name of Sir Thomas Mitchell will be remembered with respect, as one of the earliest and most useful explorers of these rapidly-rising colonies.

MOLESWORTH, the Right Hon. Sir William, Bart., M.P., F.R.S., died in October last, at his residence in Eaton-place, in his forty-sixth year. Sir William was the eighth baronet of Pencarrow, Cornwall, her Majesty's principal Secretary of State for the Colonies, and M.P. for Southwark, a deputy-lieutenant and magistrate of Cornwall, &c.

On his entry into public life, Sir William joined with that section of philosophical Radicals, who were for a period united by subscription to the doctrines of Bentham; he contributed to the 'Westminster Review,' and published at his own cost an elaborate edition of the works of Hobbes. He took office, with a seat in the Cabinet, some three years ago; and, last spring, was raised to that particular office, the Colonial Secretaryship, for which universal consent pronounced him to be so eminently fitted. Sir William, on the recommendation of Sir Roderick Murchison, appointed our Associate, Dr. P. C. Sutherland, who had previously accompanied Captain Penny and Captain Inglefield to the Arctic regions, as Government Geologist and Surveyor at Port Natal, a post for which his abilities eminently qualified him.

NEELD, Joseph, Esq., M.P., F.S.A., F.L.S., died, at his residence in Grosvenor-square, last March, aged 67. Mr. Neeld was a Deputy-Lieutenant of Wiltshire, M.P. for Chippenham, and High Steward of Malmesbury.

OUTRAM, Sir Benjamin Fonseca, M.D., R.N., C.B., F.R.S., also one of the earlier Fellows of this Society, died at Brighton in February last, aged 82. He was the son of Captain W. Outram, was first employed in the medical naval service in 1794, and rose to the rank of surgeon in 1796. He graduated at the University of Edinburgh in 1802, became a licentiate of the College of Physicians in 1810, and was a few years since elected a Fellow. During the long war he was actively engaged in his professional duties, and received

a medal and clasps for the actions in the 'Nympho,' the 'Boadicea,' and the 'Superb.' He was appointed Inspector of Fleets and Hospitals in 1841, and in 1850 nominated a Companion of the Bath and a Knight Bachelor. Sir Benjamin took a lively interest in the pursuits of this Society, and constantly attended its evening meetings. He was a true friend and a kindhearted man, and in his will bequeathed various sums to several charitable institutions.

PARRY, Rear-Admiral Sir William Edward, Kt., D.C.L., F.R.S., &c. &c.—It is now my melancholy duty to pay a tribute of respect and regard to our great Arctic navigator, Sir Edward Parry, whose memory will ever be coupled with the records of Arctic adventure of the nineteenth century. Early associated with Sir E. Parry as a messmate, afterwards his first lieutenant during the memorable voyage to Melville Island, and his friend through life, I shall, I am sure, be excused for dwelling on his distinguished career. He was born at Bath in the year 1790, and entered the Royal Navy at the age of twelve, under the patronage of Lord Cornwallis. Zealous in his profession, intelligent and ambitious, Parry soon recommended himself to notice, and in January, 1810, he was promoted to the rank of Lieutenant and appointed to the 'Alexander,' employed in protecting the Spitzbergen whale fishery. It was here that he first became acquainted with that frozen ocean, amidst whose dangers and difficulties he was destined to earn celebrity. Subsequently serving in the 'Hogue,' he assisted in destroying twenty-seven of the enemy's vessels, three of which were heavy privateers. This, and a few skirmishes with the Danish gunboats, are the only actions with the enemy which fell to his lot.

On his return to England in 1817, the extraordinary changes reported to have taken place in the state of the Polar Sea, determined the Government to equip an expedition for Arctic discovery. Then was the turning-point in Parry's life. Like most men of enterprise, he seized the occasion and determined to devote himself to Arctic adventure. There are but few who have not, at some time, the chance of distinction, and Parry took advantage of his. We accordingly find him in command of the 'Alexander,' and, under the orders of Sir John Ross, leaving England in quest of the North-West Passage, by way of Davis Strait; the result of this expedition, it is well known, was the restoration to our map of the outline of Baffin Bay, and the re-discovery of the famed Lancaster Sound.

Dissatisfied, however, with the account which had been given of



the result of this voyage, and anxious to remove an erroneous impression conveyed by Sir John Ross on the subject of Lancaster Sound, he made such representations to the Admiralty as induced Government to send another expedition to the same place. Of this expedition Sir E. Parry was appointed chief. During the voyage, an opportunity occurred for displaying that vigour and determination in overcoming difficulties, which, though they might daunt the generality of men, were unable to turn him from his purpose. In the upper part of Baffin Bay there presented itself what appeared to be an impenetrable barrier of ice; undismayed by the dangers that threatened, he dashed into the midst of it, accomplished his purpose, and entering Lancaster Sound in safety, succeeded in passing over that imaginary chain of mountains with which Ross had closed the strait.

The demolition of these phantom mountains, and the discovery of the opening into the Polar Sea on the west, of Prince Regent Inlet on the south, and of Wellington Channel on the north, together with Parry Islands (the Ultima Thule of Arctic discovery) and Banks Land, the terminating points of Sir E. Parry's and Sir R. M'Clure's explorations from opposite directions, were the consequences of the first summer of this expedition. Having passed the meridian 110° W., the Commander and his associates became entitled to the award of 5000*l.* offered by Government for the encouragement of Arctic enterprise. The winter they were destined to pass in this dreary region afforded another opportunity for Parry to display those qualities which so eminently fitted him for the work he had selected, since, by his admirable arrangements for the health, comfort, and amusement of his men, he was enabled to keep the crews in vigour, mental and bodily, while, by the vast number of observations he carried on, he determined his geographical position with a precision worthy of a better object.

In the following spring, by an overland journey, he discovered Liddon Gulf, where his broken cart remained to be seen by M'Clintock, thirty years afterwards. Finding any farther advance with his ship impossible, he determined in the latter part of the summer of 1820 to return to England, where he arrived in safety, and received, on all sides, a most enthusiastic greeting. He had but little rest, however, for in the May following he was again appointed to command another expedition, which was to proceed by way of Hudson Strait and Sir T. Rowe's Welcome. Although this voyage, like the last, failed in its main object, much valuable geographical know-



ledge resulted from it, and considerable information as to the Esquimaux tribes of that region was obtained. On returning to England Parry was promoted to the rank of Captain, and in another year found himself once more on his way to the frozen North, in order, if possible, to co-operate with an overland expedition under Franklin. This was the last of Parry's North-Western voyages. The subject of our memoir was now confirmed in the office of Hydrographer to the Admiralty, which had before been temporarily held by him; still, however, directing his attention to Arctic research, he offered to carry out a scheme, which had been proposed in 1818 by Franklin and myself: namely, to attempt reaching a high northern latitude by travelling over the Spitzbergen ice. He accordingly sailed in 1827 for Hammerfest, and doubtless would have succeeded in his object but that an unexpected impediment presented itself; for the ice over which he travelled was found to move southward at almost the same rate he advanced northward, and he was most unwillingly compelled to retrace his journey, having proceeded to 82° 45' N. lat.—farther towards the Pole than any of his predecessors.

In 1829, Parry was appointed Commissioner for the management of the affairs of the Australian Agricultural Company, and, in pursuance of the duties of the office, took up his residence at Port Stephen, 60 miles to the north of Sydney. Before leaving England, he received the order of knighthood, and was created D.C.L. of Oxford.

Returning once more to England, after an absence of five years, he was made Poor Law Commissioner in the county of Norfolk, but did not long hold an appointment which was uncongenial to his tastes. Soon after this, Sir E. Parry was selected to organize and conduct a newly-created department of the Admiralty, under the title of Comptroller of Steam Machinery, and it was during the time that he remained in this office, that the screw-propeller, now indispensable to our fleets, was introduced into the navy.

In 1847, in consequence of failing health from over-work, he resigned this also, and became Captain-Superintendent of Haslar Hospital; and, in 1853, the Lieutenant-Governorship of Greenwich Hospital falling vacant, he accepted it.

Disease, however, had begun its ravages, and, under the direction of his medical advisers, he determined to try the waters of Ems. On his way to these baths he was detained by exhaustion at Coblenz, and only reached Ems to die.

Thus ended the career of one of the most distinguished officers of his age, who had spent his days in active usefulness, and whose life

was remarkable not only for its varied character, but also for the genuine and unaffected piety which pervaded it.

Among the works which Sir E. Parry left behind him, we may enumerate a small volume on 'Astronomy by Night,' another on the 'Parental Character of God,' and an 'Address to the Sailor,' besides the narrative of his voyages, which, in value, compete almost with those of Cook. We find him also associated with three papers in the Transactions of the Royal Society.

PHILLIMORE, Joseph, Esq., D.C.L., was the eldest son of the Rev. Joseph Phillimore. He graduated in Civil Law, becoming B.C.L. in 1800, and D.C.L. in 1804. He had been distinguished for his scholarship, and especially for the talent for composition which he displayed, as well at Westminster, as after his removal to Christ Church, where he gained the College prize for Latin verse. In 1798 he obtained also the University prize, which was adjudged to his English essay on 'Chivalry.' After some residence in foreign parts, he settled in London, and was admitted an advocate in Doctors' Commons 1804. On the death of Dr. Lawrence, in 1809, he was nominated judge of the Cinque Ports by Lord Hawkesbury; Chancellor of the Diocese of Oxford by Bishop Moss; and Regius Professor of Civil Law at Oxford—an office upon the reputation of which his classical taste and language have shed additional lustre.

On the installation of the Marquis Camden as Chancellor of the University of Cambridge in 1834, Dr. Phillimore was invited to Cambridge, to receive an honorary degree from the sister University.

PUSEY, Philip, Esq., D.C.L., F.R.S., of Pusey Park, Berkshire, died July last, at his brother's residence in Christ Church, Oxford, aged 56. He succeeded to the family estates on the death of his father in 1828, and entered parliament in 1830, as one of the members for Chippenham.

As a practical agriculturist, Mr. Pusey was highly distinguished. He was the President of the Royal Agricultural Society in 1853, and he edited and largely contributed to the Journal of that Society. He was universally beloved, for there was a natural frankness and warm-heartedness with him, that developed themselves in every relation of life; and among his tenantry it was impossible for any one to be more highly esteemed.

SANTAREM, le Vicomte de, Manoel Francisco de Barros e Sousa da Mosquita de Macedo, Leitao e Carvalhaza, Corresponding member of this Society.

This learned Portuguese, born at Lisbon in 1792, was a member



of one of the most ancient and illustrious families of Portugal. After having received an excellent education, he was sent as minister of Portugal to the Court of Denmark; recalled after the revolution of 1820, he was appointed, in 1823, keeper of the archives of the realm, having already, in 1821, during a sojourn in Paris, collected numerous documents bearing upon the history of Portugal from among the MSS. in the 'Bibliothèque Royale.' In 1827, he was appointed Minister of Foreign Affairs, but shortly afterwards, upon his retirement, he proceeded to Paris, where he joined the Geographical Society in 1835, and was afterwards elected Vice-President. The library of our Society is enriched with numerous works from his pen; and it was but last year that my predecessor in this chair directed the attention of the world to his beautiful work on the 'Discoveries of the Portuguese,' and other labours, which have been so suddenly interrupted by his death, which took place in February, 1856.

SYMONDS, Rear-Admiral Sir William, K.H., C.B., F.R.S.—late Surveyor of the Navy—died in March, on his voyage from Malta to Marseilles, aged 74. Sir William entered the navy at an early age, and, during the early part of his career, was much engaged in active service on the coasts of France, Spain, and in the West Indies. He obtained post rank in 1827; and in 1831, Capt. Symonds was enabled, through the munificence of the Duke of Portland, to build the 10-gun brig 'Pantaloön,' the triumph of which vessel led to the construction, under his superintendence, of the 'Vernon,' 50; 'Vestal,' 26; 'Snake,' 16, and others. On June 9th, 1832, he was offered, and accepted, the appointment of Surveyor of the Navy, which he continued to fill until 1847.

Sir William Symonds received the honour of knighthood for his services, and the thanks of the Admiralty in 1830 for a memoir containing 'Sailing Directions for the Adriatic Sea;' and again, in 1837, for "the valuable qualities of his several ships, and for improvements introduced by him into the navy." He was elected a F.R.S., 1835, and nominated a C.B. on the Civil division, 1848. In 1854 he became a Rear-Admiral on the retired list.

URCULLU, Don José de, was born in Hamburg on the 8th April, 1787. His father, D. Manuel de Urcullu, the Spanish Consul in that city, brought him, at an early age, to Bilboa, where he had possessions. On the death of his father, he was sent to be educated to the college of São José de Calasan, in Saragossa, where he graduated in the faculty of Philosophy. In 1807, having



completed his studies, and being then little more than 20 years of age, he entered the regiment of Saragossa, and was made prisoner by the French in 1808. He continued in the military profession till the year 1820, when he left it, having attained the rank of Captain, and dedicated himself, with all the ardour of a studious mind and a lively imagination, to the pursuit of literature; writing and translating various works in prose and verse. These works gained for him the distinction of being nominated a Corresponding member of this Society; of the Geographical Society of Paris; and of Rio Janeiro. In the year 1822, when secretary to the Captain-General, he married the eldest daughter of Mr. Richard Allen, the English Consul at Corunna; and the Consul dying soon after, he proceeded with his wife and family to establish himself in the city of Oporto, but was obliged to emigrate to England in the following year in consequence of political disturbances. He returned to Oporto in 1827, and was appointed manager of the Fiscal Department of the Royal Tobacco Contract, and subsequently Administrator of the Commercial Press of Oporto. In the same year he was appointed Consul of the Republic of Peru at Oporto. In 1847 he returned to Oporto from Puerto de Sta. Maria; and in 1850, at the request of a private friend, resident in Bilboa, he went to that city to open and direct a college for superior education, which undertaking he carried out with the most praiseworthy success. Finding, however, himself in ill health, he returned in 1851 to the bosom of his family, and, after long and severe suffering, he died, much lamented by his relatives and friends, by whom he had been always esteemed for his many virtues and high character. He was buried in the cemetery of Nostra Señhora da Lapa, in the city of Oporto.

WHARNCLIFFE, John Stuart, Lord, F.R.S., second Baron Wharncliffe of Wortley, county of York, died in October last, at his residence, Wortley, Sheffield, at the age of 54.

His Lordship was greatly attached to agriculture, seeking all the newest modes to improve the culture of the land. He addressed a letter to Philip Pusey, Esq., on Drainage, published in the Journal of the Royal Agricultural Society.

WIDBRINGTON, Captain Samuel E., R.N., F.R.S., died January last, at his residence, Newton Hall, near Felton, Northumberland. He was the eldest son of the Rev. Joseph Cook, M.A., of Newton. In October, 1829, Captain Cook went to Spain, and having subsequently resided for three years in that country, he published, in 1834, in two volumes octavo, 'Sketches in Spain during the years 1829-30-31

and 32, containing Notices of some Districts very little known; of the Manners of the People, Government, recent Changes, Commerce, Fine Arts, and Natural History.' This work, which was dedicated to Lord Prudhoe (afterwards Duke of Northumberland), was the most complete account in our language.

In 1843 (having then assumed the name of Widdrington) he repaired to Spain again, and, in the following year, published another book, entitled 'Spain and the Spaniards in 1843,' in 2 vols.; also dedicated to the Duke of Northumberland.

Captain Widdrington was a magistrate and deputy-lieutenant of Northumberland.

WIELHORSKI, the Count de, who died in the Crimea, whither he had been despatched by the Empress of Russia upon a charitable mission of relief to the sick and wounded of the Russian army. This amiable young nobleman was well known to this Society in connection with his kind services in procuring the necessary letters of introduction to the governors of Russian America for various Arctic commanders, as well as for his presentation to our library of the 'Agricultural and Statistical Atlas of European Russia,' with a translation into good English, made by himself at the request of our Secretary.

YATES, Joseph Brook, Esq., F.S.A., the last name on our list, and one of the earlier Fellows of this Society, died in December last at Liverpool, aged 75.

Mr. Yates was educated at Eton, and subsequently became actively engaged in commercial pursuits, which however in no wise diminished his taste for literary and scientific subjects. In 1812, he and Dr. Traill, now of Edinburgh, mainly contributed to the foundation of the Literary and Philosophical Society of Liverpool.

In 1839, Mr. Yates drew attention to a subject of great local importance—the rapid changes which take place in the mouth of the Mersey; and noticed the possible difficulties which might hereafter be experienced in the commerce of the port. These had attracted the attention of the marine surveyor and of many ordinary observers, but it was not easy to discover a cure for an admitted evil. At the meeting of the British Association at Liverpool in 1854, Mr. Yates, in a paper read before the Geographical section, again directed attention to the subject, and a committee was appointed to inquire into the whole matter, which has held its sittings in the house of the Royal Geographical Society, and which is still pursuing its labours.

In the pursuits of geographers and travellers he took a deep interest, and he possessed some curious mediæval maps and charts.



In February, 1838, he read a paper on the State of Geographical Knowledge and the Construction of Maps in the Dark Ages, with an account of their revival in the sixteenth century. He was a Fellow of this, of the Antiquarian, and of several other learned Societies.

#### GEOGRAPHICAL PROGRESS.

The great military events in which the country has been engaged during the past year, and the objects to which the energies of the nation have necessarily been directed, may naturally be supposed to have diverted attention from those pursuits of science which are not of a military character. Although this may be true in some respects, yet much has been accomplished in the branch of science which we cultivate, and but few of the meetings of the Society have passed without some addition to our store of geographical knowledge.

#### EUROPE.

*Great Britain—Ordnance Survey.*—The present year will be marked as a great epoch in the history of the geography of our own country. The Trigonometrical Survey, which commenced, in 1784, under General Roy, R.E., has just been brought to a close under Lieut.-Colonel James, R.E., the present zealous superintendent of the Ordnance Survey. The principal object which the Government had in view when the Trigonometrical Survey was commenced, was the determination of the difference of longitude between the observatories of Greenwich and Paris; and for this purpose a base line was measured on Hounslow Heath, from which a series of triangles, including the Observatory of Greenwich as one of the points, was carried to Dover and the opposite coast of France. The French geometers at the same time extended their operations also to the coast, and the connection between the triangulations of the two kingdoms was made by conjoint simultaneous observations.

This chain of triangles from Hounslow to Dover was then made the basis of the Topographical Survey, which was also in progress at that time under the Master-General of the Ordnance; and from Hounslow as a starting point, the triangulation has been carried over the whole extent of the United Kingdom. Lieut.-Colonel James has recently communicated to the Royal Society the principal results of the Trigonometrical Survey, in a paper 'on the Figure,



Dimensions, and Mean Density of the Earth, as derived from the Ordnance Survey.' In this communication, he states that now that the observed angles have been corrected by the most refined methods of mathematical science, the triangulation is rendered perfectly symmetrical and consistent in itself, so that, any side being taken as a base, the same length will be reproduced when it is calculated through the whole or any part of the triangulation. This, as regards the angular measurements, leaves nothing to be desired; and when the five measured bases are incorporated in the triangulation, although some of them are 400 miles apart, and from 5 to 7 miles in length, the greatest difference between the measured and computed lengths of the bases does not amount to 3 inches; and it may be safely affirmed that such a degree of accuracy was never before attained in so extensive a triangulation.

Astronomical observations have been taken at numerous trigonometrical stations for the purposes of determining their latitudes, and by comparing the amplitudes of the astronomical with the geodetical arcs, the figure and dimensions of the Earth have been determined. In determining the most probable spheroid from all the observed amplitudes, continues this talented officer, it was evident that the plumb-line was deflected from the true direction of the zenith at several points, and that this was the case at the Royal Observatory of Edinburgh and Arthur's Seat near it, to the extent of 27" to the south. The configuration of the ground—the great valley of the Frith of Forth being on the north, and the range of the Pentland Hills on the south—presented a tangible cause for the deflection; but as the contoured plans of this district were published, and Colonel James was himself personally acquainted with the geological structure of the country, he had observations made on the summit and on the north and south flanks of Arthur's Seat, with the view of determining the amount of the attraction of its mass, and from thence deducing the mean specific gravity of the Earth. The computed deflection of the plumb-line due to the configuration of the ground, accounted in great measure for the observed anomaly in the amplitudes of the arcs of the meridian. The longest arc of meridian which has been computed in Great Britain, extends from Dunnose in the Isle of Wight, to Saxaford in the Shetland Islands, and is 10° in length. The Polar diameter of the Earth, as determined by the Ordnance Survey = 7,900 miles; the Equatorial = 7,926; the compression =  $\frac{1}{251.11}$ ; the mean density = 5.316.

These great geodetical operations have now been brought to a

close, and a full detailed account of them is in the press, and will be shortly published. The latitudes and longitudes are now being engraved on the marginal lines of all the first published sheets of the Survey of Great Britain. The progress of the detailed Survey of Scotland and the northern counties of England has frequently been brought to the notice of this Society, and much dissatisfaction has been expressed at the slow progress which has been made. Since 1851, when the Committee of the House of Commons, of which Lord Elcho was chairman, reported upon the subject, the question as to the scale upon which the MS. plans should be drawn may be said to have been under constant discussion; and for two years of this period, the officers engaged in the survey, in consequence of the frequent change of orders and the long period during which they were without any orders whatever, made scarcely any progress at all. Another Committee of the House of Commons has recently reported upon the subject. They had before them, the written opinions of the most able professional and scientific men in the kingdom; and, continues Col. James, it is to be hoped that the recommendations of that Committee will now be finally adopted for the future guidance of the officers on the survey. They are, as nearly as possible, having reference to the difference in the standards of measure in the two countries, conformable to the instructions for the survey of France, viz.—

1. For the *cultivated districts* the original plans are to be drawn on the scale of  $\frac{1}{25334}$  of the linear measure of the ground, or 25·334 inches to a mile, which is sensibly the same as one square inch to one acre.

2. The *uncultivated districts* are to be drawn on the scale of 6 inches to a mile, and the 25-inch plans are also to be reduced to this scale, previous to the whole being reduced to the scale of one inch to a mile, to complete the general map of the kingdom on that scale.\* The object which the Government now has in view is, to make the National Survey the basis for the valuation and registration of the sales of property, to facilitate the transfer of property, and for all general or local engineering purposes, including the Hydrographical and Geological Surveys, and every purpose for which an accurate, authentic plan or map is required. This gives an importance to the survey which it never before possessed; and with the ample funds which the Government appear disposed to grant, it is expected that

\* An arrangement which will, I am sure, be gratifying to our excellent *ex-décoré* President, Sir R. Murchison, who so strenuously advocated it in his last Address to this Society.—See Vol. XXIII.



the whole of Scotland will be finished, as well as the north of England, within ten years.

The system of registering the levels by means of horizontal contours has been for some time generally adopted on the Ordnance Survey, and their great value is now very generally acknowledged. The contours, when reduced to the one-inch scale, form the most perfect basis for the hill-sketching; and the plans now produced are the most perfect in all respects which were ever made. In England, the counties of Lancaster, York, and Durham have been surveyed for the large scales. In Scotland, the shires of Wigton, Kirkeudbright, Edinburgh, Haddington, Linlithgow, Fife, Kinross, Ayr, Dumfries, Peebles, with the Isle of Lewis, have been surveyed. Eight of the above counties have already been published, and the remainder are in course of publication, whilst the survey is now proceeding in Berwick, Lanark, Roxburgh, and Selkirk-shires.

The one-inch general Map proceeds *pari passu* with the surveys on the larger scales.

The whole of Ireland has been published on the 6-inch scale, and the 1-inch map is rapidly progressing, and several of the sheets are published.

• While the subject of our Trigonometrical Surveys is under consideration, I may mention, on the authority of Col. James, that the Surveys of our Colonies are proceeding in the following places, under officers of the Royal Engineers, having, in most places, men of the Royal Sappers and Miners under them:—Australia, Tasmania, Ceylon, Mauritius.

*Admiralty Surveys.*—To a maritime nation like Great Britain, the importance of detailed nautical charts, with ample sailing directions for the guidance of the mariner, is too obvious to render any excuse necessary for entering with some minuteness into the state of the survey of our own shores. A rapid reconnaissance of a coast might have been tolerated half a century ago; but such a survey of any shore, much less of our own shores, cannot now be accepted. The Ordnance large-scale survey, with its almost mathematical exactness (within certain limits), and the labours of the civil engineer, with his accurate lines of levels extending across the island from sea to sea, have shown us that greater accuracy in our coast surveys has become requisite. Hence the necessity, among other considerations, of determining the tide levels with the greatest care in our estuaries and rivers. This has lately



been done by Commander Alldridge, whom I have the pleasure to acknowledge as a pupil of my own, in the river Dee, and in other places; by Mr. E. K. Calver in the Orwell and Tyne; and by Captain Williams in the Fal; while at the same time the progress of the tide wave, marked by the successive times of high water, has been carefully recorded, and the results have been of much assistance to the civil engineer.

*England.*—I learn from our able and zealous hydrographer, Capt. Washington, R.N., that on the south of England, Lieutenant Cox and Mr. Osborne have mapped the coast from the Bill of Portland westward to Golden Head, including the remarkable shingle beaches of Abbotsbury and the Chesil Bank, and have made a detailed plan of the harbour of Bridport. They have now begun a careful examination of Plymouth Sound, the result of which must be looked forward to with much interest, as it will show what effect the breakwater has had upon that anchorage, during the forty years that have elapsed since the stone of that structure first raised its head above the level of low water.

In Cornwall, Captain G. Williams and Mr. Wells have completed the thirty miles of coast between Fowey and Falmouth, with plans on a large scale of the harbours of Pentuan and Mevagissey, the latter so valuable to our pilchard fishery.

In the Bristol Channel, Commander Alldridge and Mr. D. Hall have produced an excellent plan of the rivers Taw and Torridge, leading up to Barnstaple and Bideford on the north coast of Devon. Their last year's work, namely, the plans of Milford Haven, with Pembroke Reach, on the scales, respectively, of 4 inches and 12 inches to a mile, have been published at the Admiralty.

Farther north the channels and shoals at the entrance of the Solway Firth have been re-examined, and the charts have been corrected for the material changes, which have occurred during the last twenty years, since this Firth was originally surveyed.

A new edition of Part I. of the Channel Pilot, comprising the entrance of the Channel and the coast of England as far as the Downs, has been compiled by Mr. J. W. King, R.N., and published at the Admiralty. Part II., which will contain the north coast of France, from Grisnez to Ushant, is well advanced.

*Scotland.*—The remarkably broken outline and indented shores of the Western Highlands of Scotland, embracing picturesque fiords and lochs, afford constant occupation for a large force of surveyors. Commanders Bedford and Creyke are employed in Argyllshire; and

parts of Jura, of Loch Spelve in Mull, and Loch Feochan, have been mapped during the past season.

More to the north Commander Wood, and Messrs. Jeffery and Taylor, are engaged on the shores of Skye, and have recently examined its northern coast from Loch Sligachan to Kyle Akin and Kyle Rhea. The nautical survey of these coasts, however, can only proceed slowly, as the coast surveyors have to do not alone their own legitimate work, but that of the Ordnance also, as the land survey has not yet reached the Western Highlands and islands of Scotland.

With the exception of part of the Isle of Lewis, the Hebrides are yet unsurveyed; but a strong force, under Captain Otter, has again broken ground there, and there is reason to believe that this outlying portion of the realm of Scotland will not much longer remain the opprobrium of our maps and charts.

The Orkneys and Shetland have been revisited, during the past summer, by Mr. E. K. Calver, in order to revise and prepare for immediate publication the sailing directions of those intricate groups. This work has been very satisfactorily executed, and the Directions are now passing through the press.

In the Firth of Forth, Lieutenant Thomas and his assistants have examined the coast of Fife as far as Fifeness; they have filled in the deep-water soundings to the eastward of the isle of May; and if the season prove favourable, they will this year complete the survey of the Firth of Forth as far as St. Abb's Head, its natural southern limit.

*Ireland.*—Captain Washington, continuing his report, observes, in the county of Antrim, on the north-eastern shore of Ireland; Messrs. Hoskyn, Aird, and Yule have mapped the coast from Carrick-a-Rede southwards to Garron Point, a distance of about 40 miles; they have also connected by soundings Rathlin Island with the Main. The same party is now employed in recording the remarkable improvements that public spirit and good engineering have within the last few years effected in the harbour of Belfast.

On the coast of Donegal, Captain Bedford and Lieutenant Horner have completed an elaborate and admirable plan of Lough Swilly, which shows all the striking features of that fine inlet of the sea, which has often proved a harbour of refuge to the toil-worn mariner in the hour of need.

On the south-west coast of Ireland, in the county of Kerry, Commanders Beechey and Edye, with Mr. W. B. Calver, have made a beautiful plan of Castlemaine harbour and bay, and are now ad-



vancing along the northern shore of the peninsula which forms the southern limit of Tralee Bay.

A little farther to the southward, on the same coast, Commander Church and Lieutenant Veitch have mapped the shore of Kerry, from Ballinskelligs Bay to Port Magee, and for the first time laid down correctly and given us the soundings around those striking schistose rocks, the Skelligs, which rise, almost precipitously, to a height of 700 feet above the level of the water, and on which bursts the whole force of the Atlantic ocean swell. This was a labour of no common kind, and required for its accomplishment a combination of skill, seamanship, and persevering energy that falls to the lot of few.\*

*Baltic.*—A time of warfare, at first sight, would not seem favourable to the advancement of hydrographical knowledge, or at least to the more peaceful branches of science, yet, observes Captain Washington, we are enabled to state that at the close of the struggle now happily terminated our acquaintance with the Baltic, and the Gulfs of Finland and Bothnia, is considerably in advance of what it was when the campaign opened; but it is to the Danish, Swedish, and Russian charts of those seas that we owe the fact of our ships being enabled to pass the Kattegat, the Belts, and the Sound without hesitation, and to navigate the inner gulfs of the Baltic without danger. Notwithstanding all the vague assertions to the contrary, it does not admit of a question, that no fleet ever left the shores of Great Britain so well provided with charts as the Baltic fleet. It is but an act of justice to the eminent hydrographers of Denmark, Sweden, Norway, and Russia (with whose charts the fleet was furnished), that their fame should be vindicated. The names of Zahrtmann, Klint, Vibe, and Lütke are of European reputation, and afford ample guarantee for the accuracy of the charts published under their superintendence. That opportunities have since been afforded for making additions to them is only what might

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\* It is with extreme regret that I have to add that this was the last labour of Commander Church. On his way to Ireland, after depositing his charts at the Admiralty, he was suddenly taken ill at Bristol, and in three days was no more. His worn-out frame, which had toiled for many years under an African sun, and had bravely buffeted with the Atlantic surge while mapping the coasts of Cork and Kerry, sunk under the attack, and thus deprived H.M. service of one of the best of its surveyors. Skilful, energetic, zealous, of unbending integrity, and a thorough seaman, he combined all the qualities of an accomplished surveyor; and so long as the Fastnet Rock and Cape Clear continue to be the landfall of vessels crossing the Atlantic from America, the mariner will have cause to bless the skilful hand that, by accurately defining the dangers of that iron-bound coast, has converted them into friendly landmarks for which the sailor may safely steer.



have been expected. A fleet numbering occasionally 100 sail could not be cruising for two summers in a narrow sea without taking soundings; and it is highly to the credit of the masters of that fleet generally that they availed themselves of every occasion of adding to the charts all the information they obtained. Our special surveyors, Captains Sullivan and Otter, and their assistants, Commanders Cudlip, Creyke, and Bursial, and Lieutenant Ward, R.N., were enabled to make plans of Led Sound in the Åland Isles, and the approaches to Bomarsund; of Barö and Häst Sounds, with the southern access to Sweaborg; of Wormsö Sound on the south side of the Gulf of Finland, with various tracks as far as Torneå and Haparanda, at the head of the Gulf of Bothnia.

It is worthy of special remark that the magnetic variation throughout these seas was found to be sensibly decreasing; indeed such proves to be the case all over the North Sea, the Irish Sea, and the Channel, and probably extends throughout the greater part of Europe; and the mariner cannot be too much on his guard against the amount of variation he finds marked on charts professing to be corrected up to the present year. The westerly variation in the British Isles appears to have reached its maximum in the year 1836, since which time it has been decreasing at an average rate of about six minutes yearly.

*Black Sea.*—As in the Baltic, so in the Black Sea, our cruisers have added materially to the charts. To Manganari's atlas of that sea, completed in 1836, several details have been added by Captain Spratt, R.N., C.B., and the surveying staff under his directions, Lieutenants Mansell, Wilkinson, and Brooker, who have discovered several rocks, especially near the Strait of Kertch, and off Anápa on the Circassian coast, which had escaped former examinations. They have also sounded around Kinburn Spit and the estuary of the Dnieper and Bug, leading up to the towns of Khersón and Nicolaief, charts of which rivers, on a large scale, have been published. An elaborate and beautiful plan of the Khersonese peninsula, including Kazach and Kamiesh Bays, and showing the position of the Allied camps and batteries, has been completed by Lieutenant Wilkinson, and is a work that does him the highest credit.

Captain Spratt's reconnaissance of the country between Kustenji and the Danube at Chernavoda, a sketch of much interest in the discussion of the various projects, either of a railway or a canal, to unite the Danube and the Black Sea, has just been published, as also his chart of the Narrows of the Dardanelles, which includes the

site of the new hospital at Aren-kieni, in Asia Minor, a few miles from the Plain of Troy.

On the coast of Egypt, Commander Mansell, in the 'Tartarus,' has commenced the examination of the north shore, from the Damietta mouth of the Nile eastwards, with a view to ascertain whether it affords a suitable site for the entrance of a ship-canal, which has been proposed to connect the Mediterranean and Red Sea by the Isthmus of Suez.

*South Africa.*—The survey of the shores of the Cape Colony advances slowly; yet, notwithstanding the scanty means placed at the disposal of Lieutenants Dayman and Simpson, the officers employed in the survey, they have been enabled to map the coast from Hangklip to Cape Agulhas and the intermediate dangers, on the scale of one inch to a mile, which will be immediately published for the benefit of the mariner. They have also surveyed Algoa Bay and Port Natal. Whatever has been done has been carefully done, and is based on the triangulation carried on by Mr. Maclear, Astronomer at the Cape, from the Observatory as far as Cape Agulhas. Much, however, remains to be effected. Both the land survey of the colony and that of the coasts ought to be pressed forward; every year that they are delayed bars the progress of the settlers, hinders the development of the resources of the district, and is attended with loss to the colonial exchequer.

The Cape Colony has the advantage of possessing a number of accurately fixed points, extending over a surface of more than 400 miles on its western seaboard, and comprising the whole country between Cape Agulhas and the mouth of the Orange River; these were obtained, at the expense of the Home Treasury, in the measurement of an arc of the meridian by Mr. Maclear, her Majesty's astronomer at the Cape of Good Hope; and the only use to which they have yet been put in improving the defective geographic and hydrographic knowledge of this part of the world, has been in the construction of the chart before noticed, of about 70 miles of coast-line between Capes Hangklip and Agulhas, by Lieutenant Dayman of the Royal Navy.

We owe this small contribution to hydrography to a catastrophe which will not soon be forgotten—the loss of H. M. troopship 'Birkenhead' and 656 lives, near Point Danger.

Algoa Bay has been lately surveyed by the same officer on a large scale, but the existing chart of the intermediate line of coast westward to Cape Agulhas is most unsatisfactory. This may be quickly re-



medied, and at small expense, by extending Mr. Maclear's arc of meridian triangles (the last of which terminates near the Breede River) along the coast to Cape Recife, and it is to be hoped that the colony, under the rule of its present enlightened Governor, Sir George Grey, will perform this necessary duty for its own benefit. A surveying vessel might then find ample field for laborious, but highly useful, employment in these seas.

*Indian Ocean.*—A chart of the Indian Ocean in two sheets has been recently published by the Admiralty, in which the curves of equal variation have been carefully laid down for the year 1855, by Mr. Frederick J. Evans, chief of the Compass Observatory. It forms a valuable contribution to physical geography. A similar chart of the Pacific Ocean is in progress.

*Siam.*—A tolerably accurate chart of the Gulf of Siam has lately been published by the Admiralty, in which some of the grosser errors of former maps and charts are corrected. It is still, however, very imperfect; but Messrs. Richards and Inskip, surveying officers on the China station, have been despatched to Siam; and there seems ground for hope, not only from their labours, but from the facilities offered by the present enlightened King of that country, that in the course of the present year the chart of the Gulf will be rendered sufficiently accurate for all the common purposes of navigation.

*Japan.*—The accidents of the late war have led to a slight improvement in our acquaintance with the coasts of the islands of Nippon and Yesso, and especially as to the Strait of Matsumae, or Tsugar (hitherto improperly named Sangar in all our maps and charts), which lies between them. This Strait has been examined by Mr. Richards, as well as a portion of the west coast of Nippon, which proves to be laid down in all our charts some 10 miles to the eastward of its true position.

*Tartary.*—Farther north, in the Gulf of Tartary—a quarter not visited by any ship of war since Broughton, in 1797—our cruisers have, during the last year, partially traced the western shore of the island of Saghalin, where coal *in situ* and fallen timber, from the wooded land above, are to be found in abundance along the shores. They have examined Castries Bay on the mainland, and traced a deep-water channel, carrying 3 fathoms throughout, towards, but not into the mouth of the Amúr. Farther to the south-west, in the parallel of 43° N., bays, harbours, and gulfs, which have received the names of Victoria, Eugénie, Napoléon, and D'Anville, have been explored and surveyed by the officers of the Allied squadrons, and



especially by MM. Bouchez, Hill, Wilder, Johnson, and May, who have completed a chart which is highly creditable to these young officers. Some useful information has also been obtained respecting the great river Amúr, and of the harbour of Aian and other points in the Sea of Okhotsk.

*China.*—A slight break has been made in our ignorance of the Gulfs of Pecheli and Leotong, by the visit of Captain Edward Vansittart, R.N., who, in H. M. S. 'Bittern,' chased a fleet of Chinese pirates to the head of the Gulf, where the greater part of them were destroyed. In this dashing affair he boldly took his ship into waters hitherto unexplored, obtained numerous soundings, and corrected approximatively the outline of the eastern shore of the Gulf.

The chart of the island of Palawan and its off-lying reefs, the result of the elaborate survey of Commander Bate, in the 'Royalist,' between the years 1851-5, has just been published at the Admiralty, accompanied by full sailing-directions. We understand that this skilful officer has returned to China to take command of a ship; may we hope that he will be employed on some service better adapted to his abilities than the usual routine of cruising or carrying despatches. There is "ample room and verge enough" in that region for the labours of several surveyors; large tracts of coast are yet unexplored, and dangerous reefs yet unexamined; and of this latter class perhaps none calling more loudly for immediate examination and marking, both by beacons by day and a light by night, than the extensive coral lagoon-reef of the *Pratas*, barely rising above the level of the sea, lying only 60 leagues to the E.S.E. of our own colony at Hong Kong, and directly bordering on the track of vessels approaching Canton in that direction, either by Dampier Strait or the Gillolo Passage.

*New Zealand.*—A general chart of this group, comprising the whole of the recent surveys under Captains Stokes and Drury, on the scale of  $\frac{1}{100,000}$  of an inch to a mile, or  $\frac{1}{1,000,000}$  of the natural scale, has recently been published at the Admiralty, together with plans of Cook Strait and Port Nicholson, which are important features of the group, as they include the settlements of Wellington and Nelson. The whole is accompanied by a complete set of sailing-directions, compiled by Captain George Richards and Mr. F. J. Evans, R.N. (both assistants on the survey), from the various Admiralty surveys which have been carried on since the year 1848, and are now brought to a close by the return to England of the 'Pandora,' Commander Drury, who brings away with him gratifying

testimonials from the colony as to the value of his services in those regions, increased by the promptitude with which he made them available to the navigator, by furnishing accurate accounts of the result of his surveys through the medium of the 'New Zealand Gazette.'

*Pacific Ocean.*—Capt. Denham still pursues his useful labours in the Western Pacific. Within the past year he has surveyed and fixed the position of Norfolk Island, to which place much interest attaches in consequence of some of the Pitcairn islanders being in course of removal to that spot, as their future dwelling. He has determined the position of Conway Reef, an extensive sandbank only 6 feet above the level of high water, and has planted coconuts upon it, with a view to render it more conspicuous hereafter, a practice which all navigators will do well to follow for the general benefit of the mariner. On his route to the Fiji Islands, Capt. Denham obtained soundings and brought up bottom from a depth of 1020 fathoms, containing thirty distinct genera of *foraminifera*, most of which belong to existing forms in the Pacific, though only traceable as fossils in the northern hemisphere. Plans of Levuka harbour and island and of the Embau waters in the Fiji group complete his work for the past season.

Farther to the east, in the North Pacific, Fanning Island has been visited by Capt. Morshead, and its true position found to be in lat.  $3^{\circ} 49' N.$ , long.  $159^{\circ} 19'$ , or 32 miles to the westward of that usually assigned to it in our charts.

*Nova Scotia.*—Plans of Halifax harbour and of the coast to the eastward as far as Shut-in-Island, resulting from the surveys of Capt. Bayfield and his party, have been published at the Admiralty during the past year on the respective scales of three inches and one inch to a mile. Their recent labours during the past season have comprised a detailed survey of the coast and harbours from Cape Canso westward to Country Harbour—a laborious and very creditable work.

In the Bay of Fundy, Commander Shortland has completed the survey of the Grand Manan islands at the entrance of the Bay, and a portion of the south-western coast of Nova Scotia. Both the above-named officers are now lending their aid and pointing out the best track for laying the submarine cable that is to connect Cape Ray, the south-west point of Newfoundland, with the island of Cape Breton, a strait only 60 miles in width with a depth of about 200 fathoms. When this connexion is made, there will, we believe, be uninterrupted communication by electric telegraph from New Orleans



on the Mississippi to St. John's, Newfoundland, a distance of about 2000 miles.

*West Indies.*—A plan of Port Escocés and Caledonia harbour, surveyed by Messrs. Parsons and Dillon, has been published by the Admiralty during the past year. These officers have recently been engaged in the examination of the islands of Santa Cruz and St. Lucia, the former of which is finished and the latter far advanced.

*South America.*—On the coast of Brazil the dangerous shoal known by the Portuguese name of *Las Rocas*, lying about 120 miles west of Fernando da Noronha, has been visited by Lieut. Parish, in H.M.S. 'Sharpshooter,' and, at the suggestion of the British Consul at Pernambuco, cocoa-nuts have been planted in the sand, with the hope that at no distant day they may by their growth serve to warn the mariner of his approach to a danger on which doubtless many a vessel has met its fate.

*Río de la Plata.*—In this river, above Buenos Ayres, Lieut. Sidney, with slight means at his command, has re-examined the approach to the river Paraná, and re-sounded the shoals in the vicinity of Martin Garcia. The whole of this vast estuary requires a careful survey. During the past year a sketch-chart of the river Paraguay from Corrientes upwards to Asuncion, by Lieut. Day, R.N., on the scale of one inch to a mile, has been published by the Admiralty; and, on a much smaller scale, the upper part of the river as high as Coimbra, from Portuguese authorities.

In the Falkland Islands a plan of Port Egmont, one of the many safe harbours in that group, surveyed by Capt. Sullivan, C.B., in 1849, has recently been published on a large scale, and may prove useful to the numerous whalers and other vessels which occasionally resort to those islands.

*France.*—I learn from my zealous and intelligent correspondent, Mr. J. B. Pentland, that the Dépôt Général de la Guerre has continued the publication of its great Map of France, 9 sheets of which have been published during the past year. This magnificent work will consist of 258 sheets, of which 175 have been already engraved. The geodesic operations of this work being concluded, it is proposed to determine astronomically the longitudes or meridian distances of the several trigonometrical stations by means of the electric telegraph; a body of officers appointed for that purpose, under Commandant Roget, are now engaged in the preliminary researches at the Imperial Observatory of Paris.



The beautiful survey, by the officers of the French *Etat-Major*, of the environs of Rome has been completed, but only one sheet has as yet been published; the remaining ones will, however, shortly be in the hands of the public.

*French Maritime Surveys.*—The maritime surveyors of France have conducted their surveys along the coasts of Italy and of the Strait of Gibraltar. M. Darondeau has completed the remainder of the survey of Western Liguria; and the whole coast of Italy may now be said to be completed from the Var to the mouths of the Tiber, and is in course of publication. M. Darondeau is now occupied in conducting operations in the Neapolitan dominions, and has already connected the islands of the Ponza group, with his triangulation of the continent.

The hydrographic expedition despatched by the French Government to survey the Strait of Gibraltar and the adjoining coasts of Morocco and Spain, has most satisfactorily completed its laborious task, thanks to the zeal of Captain Kerhallet, well known by his works on the Currents of the Atlantic and Pacific Oceans, and of M. Vincendon Dumoulin, one of the most eminent of the corps of *Ingénieurs Hydrographes* of France. The survey, based on an accurate triangulation, extends from Cape St. Lucar on one side, and Cape Spartel on the other, to Gibraltar, and on the northern coast of Morocco as far east as the Zafarina Islands. This excellent survey, I am told, is now in the hands of the engravers. The most important results of the operations of MM. Kerhallet and Dumoulin are the discovery of several new shoals off the Spanish coast; of an extensive rocky plateau, from 15 to 18 miles in length, off Cape Trafalgar; and the correction of various dangerous reefs between Cape Trafalgar and Cadiz. But by no means the least important part of this survey, is the determination of the depth of the Strait of Gibraltar, in olden times supposed to be unfathomable, and continued so until the assumption was dispelled by our able Mediterranean surveyor, Admiral Smyth. The depth of this Strait has been considerably overrated in the Spanish and English surveys, as it has been found in many parts to average from 380 to 490 fathoms only; the greatest depth being 503 fathoms (1010 mètres) about mid-channel, at one mile east of the line extending from Europa Point to Almina, at Ceuta. Numerous observations were made on the set of the currents in the Strait and on the temperature of the sea at different depths, which dispel the belief in an undercurrent setting out of the Strait. We must acknowledge with gratitude to MM. Kerhallet and Vincendon Dumoulin this great addition to our store of improved hydrography and physical geography.

In the catalogue published by the Dépôt de la Marine will be found many new charts of great interest and importance; amongst others, surveys of the French establishments on the coasts of New Caledonia.

*Spain.*—The Spanish Government has caused a survey of that kingdom to be commenced upon an uniform system, and a part of the preliminary triangulation has been completed. A series of triangles, in a meridional direction, has been carried on from Pico, E. of Malaga, on the coast of the Mediterranean, to Santander, on the Bay of Biscay, and on the direction of the parallels from the Portuguese frontier to Aragon, where it has been connected with the operations of MM. Biot and Arago for the measure of the arc of the meridian between Dunkirk and Formentera. An important addition to Spanish geography has appeared in a work entitled '*Atlas de España y sus Posesiones Ultramar,*' of which 25 sheets have already been published, constructed by our much-esteemed Corresponding member, Colonel Coello. These comprise Cuba, Porto Rico, the Philippine, Marian, and Balearic Isles, the Canaries, African possessions, and part of her continental provinces. In addition to these separate maps of the departments of Spain and of her foreign possessions, the Atlas contains enlarged plans of the principal cities and towns, and notices of the statistics, administration, and history of each division, contributed by another of our distinguished Corresponding members, occupying an eminent position as both statesman and geographer, Don Pascual de Madoz.

M. de Verneuil, the eminent French geologist, whose name has often been alluded to by my predecessors, has continued, during the past year, his geological survey of Spain and his barometric levellings. His late researches have extended over the desolate province of La Mancha, where he has fixed the height above the sea of several hundred points.

*Italy.*—The Piedmontese Government has continued the publication of the map of its continental possessions, on a scale of  $\frac{1}{100,000}$ , and it is expected that the whole will be completed next year.

The Abbé Poncelet has published the number of 360 measured heights in Northern Savoy—an interesting addition to those already given by De Candolle and Professors Cbaix and Favre. Mr. Bonson has contributed an extract of the geometrical measurements of the Sardinian Staff, which adds the positions and heights of sixty more places to the above.



The Austrian Geographical Institute of Vienna has given the public the last sheets of its great Map of Central Italy, alluded to in previous Addresses of the Presidents of this Society. The map is now accompanied by statistical data of considerable interest concerning Tuscany and the Papal States, and the work, as a whole, is a most useful and important contribution to geographical science.

As to Naples, I am not aware that any progress has been made in the publication of the survey commenced by the late General Visconti, often alluded to by my predecessors.

*Switzerland.*—From our Corresponding member, M. J. Ziegler, we learn that the geodetical and topographical operations of Switzerland have been continued in the north of the Canton of Tessin and in the chain of the Alps, crossed by the passes of Lukmanier, of Bernhardin, and Splügen. The principal labours which have been executed in the past season were commenced chiefly in a geological point of view, such as that by Dr. Heusser in Valais, which was undertaken in order to make some observations in the environs of Visp, the centre of commotion of the destructive earthquakes which, even to this day, make themselves felt.

• Professor Heusser, of the University of Zürich, has visited these places, and has given the results of his personal observations in a little work which the Society of Natural History at Zürich has published. M. Rion has published an account of the earthquakes which were felt in 1855, in the months of July and November. Meteorological observations have also been made during the past winter throughout the whole extent of the central Alps.

By the uninterrupted railway works throughout Switzerland the number of hypsometrical data is increasing, and the interest in hypsometry is becoming greater. Hypsometrical charts are more numerous, and the use of them is becoming general in proportion as we can compare with exactitude the elevation of different countries. I may particularly allude to Mr. Ziegler's Hypsometrical Atlas, in course of publication.

Our learned Associate, Professor Chaix, of Geneva, informs us of the expected return of Messrs. H. de Saussure and H. Peyrot from their journey to Mexico, and that Professor De Candolle has published, in two volumes, a comprehensive treatise on Botanical Geography. From the same high authority our Secretary has just received an interesting communication on the Hydrography of the



Valley of the Arve, which will be laid before the Society at an early period.

*Norway.*—Our Associate, Professor Munch, of Christiania, has enriched our collection with several recent maps and charts of the Coast Survey of Northern Norway, forming a series, beginning about the 64th parallel and extending to the Russian frontier.

The Coast Survey Charts of Southern Norway have also been received, as well as Professor Munch's Map of Southern Norway, Northern Norway with Finnmarken, 1852, and Norway, published at Christiania in 1854; also the Amt Maps, by Captains Hamn and Murthe.

Major Vibe, of the Norwegian Engineers, informs our Secretary that, in addition to the Coast Surveys already mentioned as having been lately published, others, by Munch, Giessing, &c., are in course of preparation.

*Denmark.*—The Royal Society of Northern Antiquaries has just held its anniversary meeting at the Palace of Christiansborg; its President, Frederick the Seventh, King of Denmark, in the chair. Prof. Ch. Rafn, our Associate, communicated an account of the proceedings of the Society during the past year, and exhibited the new volume of the '*Annales*' of Northern Archaeology and History; the new number of the Society's Review, and of the '*Mémoires des Antiquaires du Nord*.' He also laid before the Society the second part of the '*Lexicon Poëticum*' of the Icelandic language, compiled by Sveinjörn. Among the articles in the '*Annales*' may be especially noticed '*King Oswald hin Helligés (the holy) Saga*,' with a preface by Jon Sigurdsson, and translations by Thorl. G. Repp; also a notice on Virdaland's Ancient History, by Prof. A. Cronholm, of Lund; and a Grammar of the Faeröe Language, by the Rev. V. U. Hammershaimb, of North Stræamey. In the Antiquarian '*Tidsskrift*' are found papers on the *Old-English* and *Old-Nordisk*, by Gisle Brynjulfsson; on the Ancient Languages of the North, by G. E. Lund; *Old-Norsk Remains* among the Orkneys, by G. Petrie, Esq., of Kirkwall; Antiquarian Contributions from Slavie Lands and Monuments of the Bosphorus, by Edwin M. Thorson; Report on the Cabinet of American Antiquities, by Ch. Rafn. In the number just published of the '*Mémoires*' are papers on Runic Inscriptions in Sodor and Man, with a Geographical elucidation of the Irish and Scotch names occurring in the Sagas, by

P. A. Munch. The Saga of St. Edward the King, with an Introduction by Rafn and Sigurdsson; Remarks on a Danish Runic Stone from the *Eleventh* Century, lately discovered in the centre of London, with Runic inscriptions, alluding to the Western Countries, by Rafn; and, finally, one by Brynjulfsson, entitled 'De l'Ancien Roman François et de l'Influence exercée sur son Développement par les Normands.' The King communicated to the Meeting the results of the researches which he had carried out among the ancient royal sepulchres at the Cathedral at Ringsted in Seeland; upon which the Vice-President, C. F. Wegener, read a Memoir on the Tombs of King Waldemar the Great, and his Queen Sophia, daughter of Valdimir of Russia. The Secretary read a statement of the progress made during the last year in deciphering the Runic inscriptions so numerous in Scandinavia,—an account of which he is preparing for publication.

*Portugal.*—We have received, through the polite attention of Count Lavradio, several numbers of a periodical, published by the Portuguese Government, entitled 'Boletim e Annaes do Conselho Ultramarino,' which contains rich contributions to African geography.

*Germany.*—It is with great pleasure I have to notice the establishment of a Geographical Society at Vienna.

We continue to receive Herr Gumprecht's valuable 'Geographical Journal,' containing the proceedings of the Berlin Geographical Society, in addition to other material.

*Hungary.*—The ethnographical studies, by M. Valerio, of the various races forming the population of Hungary, have been published, with numerous illustrations.

*Greece.*—A work on the Peloponnesus, by M. Beulé, appears to form an excellent guide to the Morea, and is worthy of being translated.

#### ARCTIC.

At the opening of the Address of last year by my noble predecessor, the return of Dr. Rae was announced, bearing with him evidence of the fate of the long missing expedition under the lamented Sir John Franklin; and I have now to notice amongst the papers read at the meetings of the Society, the expedition consequent upon the information furnished by him. You will remember that Mr. Anderson, who conducted this expedition, pursued his route down the river Back,



bearing testimony to the great accuracy with which the distinguished navigator, from whom it derives its name, had described and laid down the features of that dangerous river. Among much valuable information which Mr. Anderson collected, will be found the deeply interesting fact of his having discovered upon Montreal Island the remains of a boat, upon part of which was cut the word 'Terror,' and upon the frame of a snow shoe the name of 'Stanley,' the surgeon of the 'Erebus,' leaving no doubt as to the fate of those unfortunate vessels, viz. that they had either been wrecked or inextricably fixed and abandoned; and confirming in all essential particulars the information brought home by Dr. Rae.\* The great interest which attaches to this journey of Mr. Anderson, intimately connected as it is with the fate of our countrymen, the sufferings and privations endured by himself and his party, will render this volume of our Journal of deep and general interest.

Scarcely had the breath of novelty passed over this sad but too certain history, when the announcement of the return of our medallist, Dr. Kane, completed the page of past adventure in search of our missing countrymen. The important discoveries of this gallant officer consist of an elongation of Smith Sound to a higher northern latitude than that of any other known land in the Arctic region, and to a higher parallel than had ever been reached by any navigator, except Parry; and of the discovery of a vast ocean beyond, apparently free from ice, with which it communicated. The patient endurance under hardship, sickness, and privation, the zeal displayed in the execution of this arduous service, and important discoveries in those inhospitable regions, have earned for Dr. Kane the unqualified approbation of this country; and the highest honour this Society has to bestow, has been awarded to him; while the modesty with which he has related his perilous adventures, and the merit he bestows upon all his party, will place his narrative amongst the most fascinating papers in our Journal.

Contemporaneously with the notice of Dr. Kane we announced the return of Commodore Rogers of the United States Navy from the seas to the northward of Behring Strait. He records having ascended Herald Island, from which he could see no land whatever; and having sailed over Plover Island, which he removes from the chart; as also the islands reported to have been seen to the north of

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\* Dr. Rae and his companions have now received the award of 10,000*l.* offered by the Admiralty for the first clue to the remains of the expedition.



Cape Yakan. He discovered a vast barrier of ice on the north, so solid as to lead him to declare that no keel has ever divided those waters.

During the last year our indefatigable Captain Collinson has returned to our shores from Behring Strait, rich in Arctic enterprise, and enjoying the distinguished honour of having, by skill, energy, and patient endurance, brought his vessel, the 'Enterprise,' safely back from her perilous adventures, and returned her to the shores, whence he departed with her; an act which should not be overlooked in the catalogue of the meritorious deeds of that highly scientific navigator. About the same period appeared 'The Last of the Arctic Voyages,' by our associate, Sir Edward Belcher; in which he gives an account of his proceedings, and of the many land and boat journeys undertaken by himself and officers under his command; completing, through their instrumentality, the northern coast of the Parry group, and adding Victoria Land and other geographical features to the cartography of those regions. Then, as if to swell the mention of Arctic enterprise, at this time appeared a reprint, by the Hakluyt Society, of the quaint but interesting documents of old voyages; and also a voluminous summary, entitled 'Scoperte Artiche,' compiled for the enlightenment of the Italians, by Conte Francisco M. Erizzo. Lastly, I have to notice among the events of the past year, as connected with Arctic enterprise, the bestowal of the honour of knighthood upon Sir Robert McClure (our medallist), the gallant officer who virtually accomplished the North-West passage—a justly-merited tribute of the nation, and a token of the high sense it entertains of the worthy deeds of those navigators who had so laboriously pursued their perilous researches in those ice-encumbered seas.\*

At this period of Arctic discovery it will perhaps be expected that I should offer some remarks upon the results and the benefits which have been derived from it by the country.

It is now nearly forty years since the revival of our Polar voyages, during which period they have been prosecuted with more or less success, until, at length, the great problem has been solved. Besides this grand solution of the question, these voyages have in various ways been beneficial; and Science at least has reaped her harvest. They have brought us acquainted with a portion of the globe before

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\* The sum of 10,000*l.* was also voted to him and his gallant companions by the House of Commons.

unknown. They have acquired for us a vast addition to our store of knowledge—in magnetism, so important an element in the safe conduct of our ships; in meteorology; in geography, natural and physical; and which has led to the prosecution of like discoveries in the regions of the Antarctic Pole. They have shown us what the human frame is capable of undergoing and of accomplishing under great severity of climate and privation. They have opened out various sources of curious inquiry as to the existence at some remote period of tropical plants and tropical animals in those now icy regions, and of other matters interesting and useful to man. They have, in short, expunged the blot of obscurity which would otherwise have hung over and disfigured the page of the history of this enlightened age; and, if we except the lamentable fate which befel the expedition under Sir John Franklin, we shall find that they have been attended with as little if not less average loss of life than that of the ordinary course of mankind. And if any one should be disposed to weigh their advantages in the scale of pecuniary profit, they will find that there also they have yielded fruit, if *not to us*, at least to a *sister nation* in whose welfare we are greatly interested, and whose generous sympathy in the fate of our countrymen endears her to us, and would render it impossible that we should begrudge her this portion of the advantage of our labours. I need hardly remind you of the Report from the Secretary of the United States Navy to the Senate, to the effect that in consequence of information derived from one of our Arctic expeditions to Behring Strait, a trade had sprung up in America by the capture of whales to the north of that Strait, of more value to the States, than all their commerce with what is called the East! and that in two years, there had been added to the national wealth of America, from this source alone, more than eight millions of dollars.

## AFRICA.

I would next direct your attention to a region widely different in its physical character to the last, but one in which we have alike pushed our discoveries, with slow and occasionally painful progress, it is true, but upon the whole with steady success—the region of Africa. It is from this country I have to congratulate the Society on the safe return of that distinguished traveller Dr. Barth, the successful explorer of a large portion of Central Africa, and of the famed city of Timbuctú. An account of this expedition is now preparing by Dr. Barth for publication, in five volumes, with maps;



and, from the extent of the work and the care bestowed upon it, we may expect to derive an enlarged knowledge of the country through which he passed.

From letters communicated by the Foreign Office, we learn that Dr. Vogel was at Gujeba in January last, and had thence proceeded to Yakoba. His last letter is from Gombé. It appears that, in attempting to reach Adamaoua, he had crossed the Binué, at a point where the steamer under Dr. Baikie had stopped, and that he there left letters in expectation that another steamer would be despatched up the Chadda. We learn with regret from Dr. Vogel that his health had suffered, but, on the other hand, we have cause to be thankful that his life had been saved through an accident, which prevented his joining a party of fifty persons going to Yola, all of whom, except two, were murdered the same day.

Our associate, Dr. Baikie, has recently published an interesting and instructive description of the voyage of the 'Pleiad' steamer up the Niger and Chadda, including a map from the original survey by Mr. D. J. May, R.S., F.R.G.S., and much general information respecting the nations and countries of that important part of Africa. In the mention of this work, which reflects credit upon its author, I must not omit to notice an oversight which I am sure Dr. Baikie will, with his usual candour, acknowledge. In alluding to the origin of the Expedition, Dr. Baikie does not mention the persevering part taken by the Council of this Society, and particularly by Sir Roderick Murchison, in promoting it; and he has entirely omitted to connect the name of M'Leod with the great and novel feature of the plan which rendered this Expedition so successful in all respects, and will govern the operations, in regard to season, of all future expeditions. It will be seen in our Journal that, early in 1852, a project for ascending the Niger *with the rising waters*, was laid before the Council by Lieut. Lyons M'Leod, who had been employed for some years on the African coast. Having been referred to the Expedition Committee, attention was directed to a clause in Mr. Laird's mail contract with the Admiralty, which provided for the ascent of one of the African rivers, by steam, at a small expense; and the Committee recommended Lieut. M'Leod to communicate with Mr. Laird and adapt his plan to this arrangement. Other steps were also taken and communicated to the Society by Sir Roderick Murchison, in his Presidential Address of that year. In 1853 the Expedition having been brought under the notice of the Government by Sir Roderick, as President of the Society, some progress



was made, but a change in the Cabinet caused delay; and in the mean time the arrival of Dr. Barth on the banks of the Upper Chadda directed attention to that branch of the Niger, and turned the proposed course of the Expedition towards it. The plan received the warmest encouragement from Lord Clarendon, but the favourable season being past, it was necessary to defer proceedings till the ensuing year. These circumstances were also laid before the Society in the Presidential Address for 1853. In 1854 the Expedition started, and it was intended that the veteran African explorer, our late member, Mr. Consul Beecroft, then residing at Fernando Po, should take the command; but his lamented decease having occurred a few days before the arrival of the party from England, the command devolved upon Dr. Baikie, with whom Mr. May, of her Majesty's ship 'Crane,' was associated as surveyor, through the kindness of Captain Miller, R.N., F.R.G.S., then chief officer on the station.

I have felt it to be due to the persevering efforts of this Society in promoting this Expedition, and to the individuals whose names are so honourably connected with it, to insert in some detail these facts connected with its origin; of which, I am sure, Dr. Baikie will acknowledge the justice and propriety.

The spirit of adventure is again revived: Dr. Baikie, the successful explorer of the Chadda, has offered his services to conduct an expedition up the Niger, and, leaving a trading party at Rabba, to pursue his route thence by land to Sokatú, the residence of the Sultan, whose influence is said to be so great, that could it only be obtained, an impulse would be given to commerce, and slavery would be annihilated.

A communication from Governor O'Connor, describing a visit to the Island of Bulama, in the Bisagos group, and a voyage up the river Casamance, informs us of the present condition of those places, and the state of the settlements there.

Captain Skene, R.N., of the 'Philomel,' is about to return from the West Coast, where he has ascended the Bonny, the Congo, and the river of Lagos, and from whose journals we may expect some interesting information.

We learn that Commander Lynch, of the United States Navy, has examined a large part of the coast of Liberia, and several of its rivers, as a preliminary to an exploration of the interior. Sickness, however, obliged him to discontinue his labours.\*

\* Of the death of Dr. Schönslein, at Cape Palmas, mention has already been

We may mention here that M. Raffeneil has at length published an account of his failure to penetrate to the interior of Africa from the French settlements on the Senegal.

Comte d'Escayrac de Lauture has presented the Society with a copy of his Memoir on Soudan, accompanied by a map, in which the positions of the principal towns and the courses of the rivers in Central Africa are discussed with great ability and research, and the habits of the people are also described. The Count has just proposed to attempt, with the assistance of the Egyptian Government, the ascent of the Nile to its sources.

The enterprising Sardinian trader, M. Brun-Rollet, whose establishment on the White Nile was mentioned in my noble predecessor's last Address, having returned to his outpost of exploration and commerce in that region, has since penetrated for a considerable distance along the Misselad; and we are indebted to our Corresponding member, M. le Chev. Negri, of Turin, for the following account of M. Brun's proceedings, dated from the banks of the Misselad, Feb. 1, 1856:—

“After a month's research M. Brun-Rollet came to reconnoitre the lake, by which the waters of the Misselad and of the Modj or Lût communicate with the Bahr el Abiad. He found it about 50 leagues in length from north to south, and discovered the entrance of the Misselad into the lake. He entered the Misselad with three boats (*barques*), and an escort of 23 soldiers, obtained from an Egyptian post recently established at the confluence of the Sanbat, in the Bahr el Abiad; and the intrepid traveller had already ascended the river for nearly 40 leagues, with the determination to push his exploration as far as possible. The Misselad appears to be so large and deep that M. Brun-Rollet, who has previously visited the Blue Nile, or Bahr el Azrek, as well as the White Nile, or Bahr el Abiad, declares that he has no doubt of the Misselad being the true Nile. It appears that during the rainy season this river inundates an immense extent of country. The vegetation of this region is magnificent, and the reception offered by the inhabitants, although not always favourable, had not been hostile. M. Brun-Rollet and his companions, among whom is Madame Brun-Rollet, a young Marseillaise, continued to enjoy excellent health.”

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made in the Third number of the Proceedings of the Society; and it is with much regret that I now hear of the decease of a young French explorer, M. Couturier, which took place at Brezina, an oasis in the Sahara, where he had stopped some time in order to acquire a knowledge of some of the native dialects.



From the Eastern Coast we have received, through the Church Missionary Society, an interesting communication from the Rev. J. Erhardt, informing us concerning a large inland sea, long known to exist, and now stated to extend over nearly ten degrees of latitude and four degrees of longitude, with a description of several routes by which different portions of this sea are visited by parties from Mombas, Tanga, Mbomaji, Kiloa, and other towns upon the sea-coast, affording facilities for discovery in that quarter, which the Council have not neglected.

Lower down, upon this coast, we have received information of the return of a party of Moors from the Western Coast of Africa. The 24th volume of our *Journal* contains an account of a journey performed by a party of Moorish traders from Zanzibar to Benguela, on the West Coast. This is the same party whose arrival we have just announced. It appears that they left Benguela on the 9th June, 1853, and arrived at Mozambique on the 12th November, 1854, crossing large rivers and passing many thickly-inhabited towns in their way; but they do not afford us any means of determining the positions of these places.

I must not conclude these brief remarks upon this contingent without calling your attention to the limited extent of our knowledge of that portion of it known as Equatorial Africa. This extensive region, occupying nearly twenty degrees of latitude, and extending from coast to coast, with the exception of the fringe of the shore on either side and the limited discoveries up the Bahr el Abiad, still remains to us almost a "terra incognita." As before observed, we have pushed our expeditions from time to time over its borders, on the north and south and on the east and west, but with sufficient success only to ascertain the general feature of the country in those directions, and to inform us in what quarter we may with the greater advantage direct our future movements. Equatorial Africa really lies still unexplored, and yet, by information from various sources, it seems to present a fruitful field to travellers. The thickly-inhabited towns and large rivers mentioned by the Arabs—the vast inland sea of Niassa mentioned by Erhardt—alone would immortalize the discoverer who should undertake the task; while the existence of mines of copper and other precious metals in that direction, if true, would bid fair to repay the toil.

The source of the Nile, yet undiscovered, lies mysteriously hidden in this vast unexplored region, and, with Niassa, asks who shall unlock its mysteries? We trust that this question will not long



remain unanswered, nor this vast inland region continue almost a blank upon our maps. There are not wanting, in this and other countries, men both willing and able to undertake the task. The gallant Commander of the expedition from Zayla to Harar, Captain Burton, has volunteered to proceed from Zanzibar inland towards the famed Sea of Niassa, and, after exploring its locality, to turn northward towards the Bahr el Abiad; and I will here mention that the Council are now in communication with the Foreign Office and the East India Company, on the subject of the means for sending out an expedition in this direction, a deputation having already had interviews with the Earl of Clarendon.

In Southern Africa, our medallist, Dr. Livingston, is still prosecuting his indefatigable researches. At the last Anniversary, we learnt that he reached Loanda in an exhausted condition, labouring under the effect of fever. His journey thither will be found most interesting, and will well repay the perusal. He then announced his intention of returning to the interior, and of visiting the great chief Muata ya Nvo, or Matiamvo, and of ultimately descending the Leeambye to Quilimane, on the east coast of Africa. By a letter from him at Cassangé, we learn that he had so far carried out the first portion of his plan; but from other sources we are informed that he left Cassangé in February last, crossed the Quango, and pushed on for a trading station, named Cobango, on the river Chihombo, with a view of carrying out his before-mentioned intention of putting himself in communication with Matiamvo. On reaching this place his health was found to have suffered much, from having slept several nights upon a vast plain entirely covered with water; and he was compelled to abandon his intention of visiting Matiamvo, and obliged to strike off southward towards the country of his companions, which he appears to have reached in safety, and in excellent health. Dr. Livingston's observations have been communicated to the Society by Mr. Maclear, the astronomer at the Cape, by whom they have been recalculated and found to be of the most satisfactory character—a feature, in the qualification of a traveller, of the first moment, and which this Society will do well to encourage.

In connection with discovery in the south-east part of Africa, Mr. Moffat, the father-in-law of Dr. Livingston, anxious to learn his fate and to forward supplies for him, had proceeded to Moselekatse's country, the full accounts of which interesting visit have been kindly forwarded to us, by the London Missionary Society, and will be printed in the Journal.

On the South-West, Mr. Hahn, the Rhenish missionary, had left Cape Town for Walvisch Bay, for the purpose of proceeding thence overland to Mossamedes. It was the intention of Mr. Hahn to settle near the mouth of the river Nourse, or Cunené, north of the Ovampo Country, and thence to make expeditions inland along its course. This river appears to be the shortest and most healthy road to this part of the interior.

That persevering and hardy explorer, Mr. Charles John Andersson, to whom the Council adjudged, last year, one of the Royal awards for his journey to Lake Ngami, has published an excellent account of his labours in South Africa, with a map, and many striking illustrations. Mr. Andersson has again started to renew his pursuit of African enterprise, and he also intends directing his attention to the Cunené River.

Lastly, I have to mention M. Lesseps' very interesting pamphlet and map of the Isthmus of Suez, showing the line of a canal which it is proposed to make between the Mediterranean and the Red Sea.

The importance of a ship canal from the Mediterranean to the Red Sea cannot be overrated in a commercial point of view, and especially to this country, when considered in connection with its Indian possessions and colonies. M. Lesseps has shown its importance in other respects, by opening out fresh sources of trade along the shores of the Red Sea itself, and otherwise; and we can only hope that the project, if undertaken, will realize the expectations it has created. The map is a good specimen of chromolithography.

If to these prospects, we add results which may be expected from our indefatigable Associate, Dr. Sutherland, who is a resident at Natal; and from the projected expedition of the United States, *via* Liberia on the west—from the continuation of Livingston's labours in the south—from the appointment of Mr. McLeod as consul at Mozambique, and from the encouragement offered by the French Geographical Society in the shape of rewards for discoveries in Africa—we may hope to see discovery pushed forward in that continent with vigour; and posterity may possibly witness the resources of this vast continent brought under the influence of European civilization, its geography known, and its inhabitants emerge from barbarism and slavery.

#### ASIA.

*India.*—By far the most important work in this quarter of the globe that has been laid before the Council in the past session is that of



the Trigonometrical Survey of a large portion of India, by Lieut.-Colonel Waugh, the Surveyor-General of India.

This work consists of geodetical operations of the highest order, carried on through countries for the most part unexplored, and, until lately, inaccessible to Europeans, or, in the words of the Society's motto, "*Terræ Reclusæ*."

The first series of this important work is mentioned by my noble predecessor in his Address, as extending from the Seronj base to Karachi; and I gather from a paper laid before the Council by our Vice-President, Colonel Sykes, that the second series of operations branches off to the north-west, from the great meridional arc at Banog and Amsot, through the plains of the Punjab, and along the southern face of the Sub-Himalaya ranges to Attock and to Peshawur. At Attock, a base of verification was measured. This series extends over seven degrees of longitude, and over a space of more than 100 miles in width. The third series consists of meridional arcs passing through Sind and the Punjab from Karachi to Attock, thereby uniting the before-mentioned bases of verification at those places; and the whole completes a gigantic geodetical quadrilateral, of which the great arc, between Seronj and Banog, forms the western side, and corresponds with a similar grand quadrilateral on the eastern side, begun and partially completed by our Associate, Colonel Everest, &c.

Too much praise cannot be bestowed upon this most elaborate and important work, carried on as it has been with such precision through countries almost wholly unexplored and injurious to the health of Europeans.

From Mr. J. Walker, the Hydrographer to the East India Company, we learn, that after the measurement of the base of verification near Karachi, a party remained to observe the latitudes, and to compute and register tidal observations; while another party was detached to build towers, to facilitate the triangulation of the Great Indus series. Another party also has been engaged on the North-West Himalaya series, the operations of which were carried on in the region of perpetual snow, and it required all the energy and determination of the parties to accomplish the work assigned to them. The Assam longitudinal series had proceeded eastward, as far as longitude  $89^{\circ} 30' 29''$ , when the party was obliged precipitately to withdraw for the season on account of the floods. The South-Coast series has been extended to Kuttaek; its farther progress, however, was retarded by the whole party having been prostrated by fever.



*Topographical.*—The Survey of the Plains of the Punjab advances satisfactorily. The work, we are informed, will be executed in a style not inferior to that portion which has already been submitted to the inspection of the members of this Society. The Ganjam Survey continues to progress. As it is now being carried on in a country hitherto almost a blank in our maps, and through a number of petty states, the names of which were hardly known, its completion is looked forward to with much interest.

*Revenue.*—These surveys are proceeding steadily. The districts of Rajeshaye, Goalpara, and the Julindher Doab have recently been completed.

Fifty sheets of the 'Indian Atlas' are now published. Several others will be finished during the ensuing season.

*Marine.*—A new and elaborate survey of the harbour and outer roads of Karachi has been executed on a large scale by Lieut. Grieve, R.N., and is now being engraved. This harbour, in connection with the railway and electric telegraph, will no doubt become one of the most important stations on the western coast of India. Another sheet of the Survey of the Malacca Strait, extending from Cape Rachado to Mount Formosa, by Lieut. Ward, R.N., has recently been sent home. The Survey of the North Preparis Channel, in the Bay of Bengal, extending from Preparis Island to Cape Negrinis, by Lieut. Ward, has also lately been published.

*Turkey in Asia.*—I have next to notice a memoir on the Map of Damascus, the Hauran, and mountains of Lebanon, from personal survey, by our associate, the Rev. J. L. Porter, containing various journeys in Syria, in the performance of which he corrected many errors in the received geography of that country. About Damascus, he finds that the Bahr el Merj is not one lake, but three distinct lakes, and that the plain around Damascus contains many villages, none of which appear on the map. Balbeck is in error in its bearing from Damascus; the Antilibanus chain requires correction. Thus the author proceeds, pointing out numerous errors in the topography of the country, and concludes by observing that the present Ard-el-Bathauzel is the ancient Batanea.

Mr. Arrowsmith is preparing a beautiful map of Syria and Palestine, in three sheets, for the Foreign Office.

We have next an important paper, comprising notes of a journey from Basrah to Bagdad, with descriptions of some Chaldean remains, by Mr. William Kennett Loftus.

In this paper the author furnishes a highly interesting description of the country through which he passed, both in a geographical

and antiquarian point of view. He visited the sites of some of the most ancient cities upon record, comprising those of Babel, Erech, Accad, and Calneh, mentioned in the Bible; and, as Sir Henry Rawlinson has observed, Mr. Loftus may be considered as the discoverer of Wurka, perhaps the Erech of the Bible. Mr. Loftus gives minute details of the country and of the various modes of irrigation. He particularly directs attention to the effect of the Hindieh Canal, a branch of the Euphrates, which diverts the main stream from its proper channel, thereby occasioning drought and causing the inhabitants of the villages, in the interior of Mesopotamia, to desert their lands. The Hindieh passes through the Bahr el Nedjef, and forms the Semava branch of the Euphrates. The paper contains much important and valuable information.

It will be remembered that in 1848 a Commission was formed for the purpose of determining the boundary line between the Turkish and Persian empires. Its members were appointed by the English, Russian, Turkish, and Persian Governments, and designated the Turco-Persian Frontier Commission. The chief of the English party was Colonel Williams, the present celebrated Sir William Williams of Kars, under whom Lieutenant Glascott, R.N., acted as chief surveyor, and Mr. Loftus as geologist. We learn from Mr. Loftus, that the surveys extended from Mohammerah to Mount Ararat, a direct distance of about 600 m.; the operations being trigonometrical on an astronomical basis. The opportunities which occurred for extending the examination of the country enabled careful route surveys, corrected by nightly observations, to be extended as far as Shiraz on the S.; along the plains of the Euphrates and Tigris to Zobeir, Meshid Ali, and Mosul on the W.; and across the mountains on the E., along the high plains of Persia, as far as the tomb of Cyrus, Ispahan, Hamadan, Lake Urumia, and Bayazid. The Commission had returned to Constantinople, and were engaged in elaborating the results of their labours when the late war broke out, and a separation of the parties constituting the Commission took place; the Russians taking with them that portion of the observations which they were contributing.

The accuracy of Lieutenant Glascott's labours has been remarkably exhibited in working out the triangulation of this survey, and the Society has already been indebted to that officer for his map of Kurdistan on a scale of 6 inches to a degree, accompanied by a list of his astronomical positions, which appeared in the sixth volume of the *Journal*.

The return of peace will, it is hoped, admit of the production of



the invaluable geographical material resulting from the international researches of the Commission.

The Vestiges of Assyria, surveyed by order of the Government of India, by Commander Jones of the Indian Navy, and published in three sheets, exhibit the topographical features of the country, in which are situated the ancient cities of Nineveh, Mosul, and Nimrud, over which the labours and writings of Layard and Rawlinson have thrown such a charm.

The return to this country of that distinguished and learned scholar in Eastern languages, Colonel, now Sir Henry Rawlinson, has been announced; and we learn that he has brought to a close, for the present, the excavations in Assyria and Babylonia. A notice of some of his labours has appeared in the Transactions of the Asiatic Society; but they are far beyond any attempt of mine to do justice to them, either in point of value or description. It is with pleasure we learn, that he intends devoting his time to describing his labours and to decyphering the numerous inscriptions he has collected, &c. &c.; a work which, if he succeed in accomplishing, must entitle him to the gratitude of the world: for, hidden under those mysterious mounds and written in those dark inscriptions, may we not hope to find the history of a great nation, whose existence was collateral with that of Israel, and which at many points touched that of the sacred people? May we not hope to read in the records of Assyria, additional proof of those wars and slaveries which are spoken of in the Bible, and to discover traces of those captives, who sat down and wept by the waters of Babylon, and hung their harps upon the willow-trees of 'a foreign land'?

*Persia.*—Abbott's 'Itineraries in Persia' contain descriptions of such parts of the route from Tehrân through Savé, Kûm, Kashan, and Ispahan, and thence to Yezd, Kerman, Shiraz, and Bunder Bushir, on the Persian Gulf, as have been but seldom or never visited by European travellers. From Bunder Bushir he crossed the Persian Gulf to the mouth of the Shat-el-Arab, as the joint stream of the Tigris and Euphrates is called, and thence by Mohammérah to Bagdad, and by Kermanshah and Hamadan to Tehrân. The route is carefully kept by compass-bearings and estimated distances, and the descriptions of the country, towns, and inhabitants, are carefully given.

*Siam.*—I mention next in order 'Notes on Siam,' with a new map of the lower part of the Menam River, by our Associate, Mr. Henry Parkes; also an interesting paper, which affords extensive information of the inhabitants, productions, and commercial resources of a country of which we had before but a very imperfect knowledge.



*Chinese Empire.*—Having already alluded to Mr. Meadows' work on China, I have only to mention the publication of a new map of Corea by Andrew Kim, edited by M. Jomard; and to allude to the want of a better knowledge of the northern seaboard of China and of North-eastern Asia generally, including particularly its navigable rivers, which recent events have proved to be so little known.

#### AMERICA.

*North America.*—During the present session, the United States Government has presented to the Society, the reports, plans, and sections of the several important expeditions despatched by order of Congress to discover the best route for a railway from the Mississippi to the Pacific, between the 32nd and 49th parallels. These expeditions, organized by the Secretary of War under various leaders, have contributed very largely to American geography, observations having been made from the Mississippi to the Pacific, between the 49th and 47th parallels—the 41st and 43rd—also near the 38th, the 35th, and the 32nd—touching upon the ocean at Puget Sound, San Francisco, S. Pedro, and S. Diego. The report of the Secretary of War, on the results of these labours, concludes, "that the route of the 32nd parallel is, of those surveyed, the most practicable and economical route for a railroad from the Mississippi River to the Pacific Ocean." Other important additions to a knowledge of the North American continent have been communicated in the Ninth Report of the Smithsonian Institution. Lieut. Beale, superintendent of Indian Affairs in California, accompanied by Mr. G. H. Heap, travelled from Westport, Missouri, to Los Angeles, on the Pacific, in 100 days, following the route, near the 38th parallel, to the Little Salt Lake, then turning south-westerly, across the Mohave desert, to the Pacific.

Our gallant medallist, Colonel Frémont, also made a special journey, along the same route, to test the depth of winter snow in the mountainous region. He reached the Huerfano on December 3rd, passed the Cochetope Pass on December 14th, where he found only four inches of snow, and reached the Little Salt Lake settlements on February 9th.

It is impossible here to do more than bear witness to the continued exertions of Prof. Bache and the officers attached to the Great Coast Survey of the United States. Their merits are sufficiently well known.

Under the auspices of the Smithsonian Institution, an examination

of Northern Wisconsin has been made by Mr. Baird, in regions almost unknown before, and several lakes and rivers have been discovered and named by him.

Captain Marcy has explored the head waters of the Brazos and Big Wichita Rivers, in Texas, a region never before trodden by white men; and a survey of the United States and Mexican boundary was also commenced by Major Emory.

Lieutenant Couch, of the United States' Army, has made a scientific journey into Mexico, at his own expense, leave of absence having been granted to him, at the instigation of the Smithsonian Institute. He went to Matamoras and Monterey, examining the adjacent sierras; thence he proceeded to Parras, the plains of Mapimi, and the Caves of Durango. Among other motives for this journey, was the acquirement of a large collection of manuscripts, maps, and natural objects, made by Luis Berlandier, a Swiss, and a member of the Academy of Geneva, who had resided in Mexico, and devoted himself to Mexican research from 1826 to 1851, when he died. This collection was found very valuable, and purchased from the widow. A catalogue is appended to the Smithsonian Report.

Among various works which have appeared, and which throw light upon the geography and ethnography of America, I notice a '*Mémoire sur les Anciennes Populations Mexicaines*,' by M. Ludewig; a treatise on the Hydrography of the Ohio, by Charles Ellet; a notice and map of the projected canal between the Pacific and Atlantic through Nicaragua, by M. Dupuy. Mr. J. H. Coffin has written upon the distribution of winds in the northern hemisphere; and great light has been cast on the comparative philology of the American languages by the labours of the Rev. R. S. Riggs, and his acquirement of the Dakota language. Mr. Julius Froebel has furnished a work on the Physical Geography of North America; and I notice an excursion to the ruins of Abo, Quarra, and Gran Quivira in New Mexico, by Major J. H. Carleton, U.S.A.

*Central America.*—In Central America, Mr. E. G. Squier, formerly Chargé d'Affaires of the United States to the republics of the Isthmus, has pursued his indefatigable researches so far, as to cause a survey to be made of the country lying between Puerto Caballos in the Bay of Honduras, and the Gulf of Fonseca on the Pacific. The results of this investigation have been stated in a Report, advocating the construction of the Honduras Inter-oceanic Railway; and also in a volume by Mr. Squier, entitled '*Notes on Central America, particularly the States of Honduras and San Salvador, their Geography, Topography, Climate, Productions, Po-*



pulation, &c. &c. with an original map and sections, which the author has presented to our library.

Our active associate Mr. Power, of Panama, has recently presented to the Society an important addition to the geography of Central America, in a tracing of an original manuscript map of the province of David, on the frontiers of New Granada and Costa Rica, made from a new survey by Colonel Codazzi. This survey has enabled an interesting portion of the Isthmus to be delineated which was previously a blank on our maps.

*West Indies.*—The Geography of Cuba has been published by Don Esteban Pichardo, under the auspices of the Royal Junta of Fomento.

Among the Papers of this Session, I notice the Landfall of Columbus, by Captain A. B. Becher, R.N. The first land in the New World that was seen by the great Genoese adventurer is a point of considerable historical interest. Hitherto, in this country, the subject has been treated in works of biography and history; but it has now been taken up by a really practical hydrographer, and the records of the Spanish archives compared step by step with the configuration of accurate modern charts. In like manner, the spot where Julius Cæsar first planted his foot upon British ground was treated of by the most eminent geographers of their day—D'Anville, Halley, Rennell, and others; but it has been left for the enlightened Astronomer Royal, from an investigation of certain phenomena which modern science had brought to our knowledge, to prove, with almost mathematical certainty, the precise spot in dispute;\* and thus, by assiduous research and comparison, has our Assistant Hydrographer arrived at conclusions by means of modern delineations with respect to the Landfall of Columbus, which seem to be worthy of equal attention.

*South America.*—The progress of geographical research in South America has been scarcely less active than in the northern and central parts of the great Western continent.

*New Granada.*—The course of the navigable river Atrato, which falls into the Gulf of Darien, has been subjected (along with its western affluents and the adjacent streams flowing to the Pacific) to the investigations of several surveying expeditions, despatched by Mr. F. M. Kelley, of New York, at his own expense. For more than fifty years, Baron Humboldt had continued to direct attention to the facilities, which the Atrato was reported to present, for establishing water-communication between the Atlantic and Pacific Oceans.

\* See 'Archæologia,' vol. xxxiv.



Actuated by the writings of the veteran geographer, Mr. Kelley has caused the whole course of the Atrato, from its mouth to its headwaters, to be surveyed; and having discovered a route, by way of the Truando, which he deems to be favourable for a ship-canal, he has considered the subject to be of so much importance to the great maritime powers, as to invite an international investigation before any further steps are taken. The scrutiny of the project, which Mr. Kelley has invited from geographers and from civil engineers in this country, has, upon the whole, been favourable to his plan; and his proposal to make a more perfect examination of the locality, seems to be a project well deserving of encouragement.

*Chile.*—Lieutenant Gilliss, of the United States' Navy, has presented to the Society two quarto volumes, published by order of Congress, comprising a portion of the results of "the Astronomical Expedition to the Southern Hemisphere" under his orders in the years 1849 to 1852.

The first of these volumes, besides a summary of the scientific observations made by Lieutenant Gilliss and the officers under his command in Chile, contains a personal narrative of their journeys in that Republic, and many interesting particulars regarding its present political state. In describing its physical geography Lieutenant Gilliss has frankly acknowledged his obligations to the scientific individuals who, under the patronage of the Chilean Government, have been for some years engaged in investigating, surveying, and describing the geology, topography, and natural resources of the Republic, especially Messrs. Claude Gay, Professor Domeyko, and Messrs. Pissis and Allan Campbell, whose labours have been long known to us in Europe.

It was a source of great satisfaction to Lieutenant Gilliss, upon the completion of his own astronomical observations, to find that the Government of Chile was desirous to purchase the valuable instruments he had with him, as well as the observatory which he had set up. These were handed over to them; and thus Chile may boast of a national observatory, in addition to the various other scientific institutions, already founded by the liberality and enlightened policy of her rulers.

The second volume contains the results of a journey made by Lieutenant MacRae, the next officer of the expedition, across the Cumbre and Uspallata Passes of the Andes, and from Mendoza to Buenos Ayres, his instructions being to make a series of observations for elevation, latitude, and longitude, as well as magnetical and meteorological, for each 3000 feet of elevation on the slopes of the

Andes, and for ~~each~~ 100 miles of longitude on the line of road across the Pampas,—a task which he completed in 60 days.

The results, which are given in a tabular form, constitute an important collection of authentic data for geographers. It is satisfactory to observe how they corroborate the accuracy of the labours of the old Spanish officers, Bauza and Espinosa, whose map of the same line of country over the Pampas was published in the Hydrographic Office at Madrid in 1810. A copious appendix gives a particular account, drawn up by various learned individuals in the United States, of the Indian antiquities, and of the zoological, botanical, and mineralogical collections made by the officers in the course of their travels.

These volumes are beautifully embellished by well-executed plates, especially the natural history part; and the work reflects great credit not only upon the scientific attainments of the officers employed in carrying out the great astronomical and geodesical work entrusted to them, but also on the industry and ability with which they have brought together a large and varied mass of information regarding the countries they passed through; and the Government of the United States has done but justice to their labours in publishing the results of this important survey in the most liberal manner at the expense of the State.

*Brazil.*—The labours of our Honorary Member, Dr. Martins, in Brazil have come before us recently under a new form, in a volume presented to us by the author, containing fifty beautiful views illustrating the vegetation of Brazil.

*Paraguay.*—From Lieut. Page, commanding the U. S. Steamer 'Water Witch,' we learn, under date "Buenos Ayres, Dec. 26, 1855," that "the embarrassments arising from the jealous prohibition of the Government of Paraguay have, to such a degree, contracted the field of operations, as to deprive this expedition of the privilege of making contributions to geographical science and natural history to the extent that I had anticipated. I nevertheless hope that our labours will prove not to have been in vain in either of those fields, and that the result may give rise to commercial intercourse with countries fruitful in natural products and susceptible of extended and varied cultivation, but whose resources as yet lie dormant, waiting for the hand of energy and industry to awaken them to life. I allude particularly to those provinces most directly interested in the navigation of the river Salado, a river rising in the Cordillera, in the western part of the province of Salta, and discharging itself into the Paraná at the town of Santa Fé.



"By our exploration of this river we have shown that the Salado is navigable to within the province of Santiago, without presenting an obstacle, and that, with the expenditure of a little labour, it could, in the course of a few months, be made navigable to within the province of Salta, a distance of not less than 900 miles by land.

"The navigation of this river will open to the provinces Jujui, Salta, Tucuman, Catamarca, Santiago del Estero, parts of Cordova and Santa Fé, an easy way by which to transport their products and merchandise, which now, under the most disadvantageous circumstances, are conveyed in ox carts of the most unwieldy construction, involving an expenditure of time and money, and prohibiting the exportation of many valuable articles of commerce which could easily and profitably be transported by the river.

"The river was ascended in a small steamer from its mouth, the distance of 150 m. in a right line, and 350 by the river. This being in July (the season of low water), the steamer could not ascend higher. The river was then entered from its upper waters; its difficulties, its obstacles to immediate navigation throughout the above extent, carefully examined; its rise and fall considered; and the result showed no obstacle that may not easily be removed; and none of those obstacles, such as shoals and banks, which, when removed from one place, reproduce themselves in another.

"We have recently discovered also a new channel between the island Martin Garcia and the coast of the Banda Oriental, of 2 ft. more water than the old channel contains. The importance attached to this discovery is not confined to the greater depth of water in the new channel, but it assumes a political character. It deprives Martin Garcia of that important geographical position which is attached to it by the Government of Buenos Ayres, in whose hands it is at this time. Instead of Buenos Ayres possessing, as she now claims, exclusive jurisdiction over the old channel, leading into the rivers Paraná and Uruguay, on the ground that her territory is on both sides, over the new channel, she has only concurrent jurisdiction with the Banda Oriental. The new channel is more easily entered, and in it vessels are not obliged to pass nearer to Martin Garcia than  $1\frac{1}{2}$  m.; thus taking from this island the perfect command it formerly had over the entrance to the rivers Paraná and Uruguay."

M. Francis de Castelnau continues the publication of his important journey in South America.



M. Delaporte has published an account of his journey in the country of the Araucanians.

Benjamin Vicuña Mackenna has reported upon the agriculture of Chile and upon European migration to that country.

M. Isambert and M. de Angelis, and Lieut. Maury, U.S.N., have written upon the free navigation of the Amazon.

#### AUSTRALIA.

By far the most important information we have had communicated to us with regard to this country is the progress which has been made by the North Australian Expedition under Mr. Augustus Gregory.

From this enterprising explorer, whose exploits in Western Australia are well known, by a letter communicated through the Colonial Office, we learn that the Expedition left Moreton Island on 13th September, 1855, in the ship 'Monarch' and the 'Tom Tough' schooner, and after nearly encountering shipwreck at the entrance of Port Patterson, was landed at Point Pearce.

At the time of the last despatch the stock had suffered from the voyage, and the horses were in a weak condition; but the Expedition was in all other respects in an efficient state, and the officers and men were all in good health and full of ardour. The horses having been landed from the ship, were to proceed round the head of the Fitzmaurice, making their way to the Kangaroo Point in Victoria River, whence the Expedition would take its final departure for the interior. No natives had been seen, but it was evident by many fires and other traces that they were numerous on that part of the coast. Through Sir Roderick Murchison some information has been received from Mr. J. S. Wilson, the geologist to the Expedition; and Mr. T. Baines, the artist, has illustrated the country about Moreton Bay by the sketches which have been laid on our table.

The importance of this Expedition in opening out to our knowledge the interior of the northern portion of Australia, in bringing us acquainted with the physical and geographical features of the country, by which we may hope to forward the progress of that most important and desirable object, the settlement of this portion of the continent; the determination of the watersheds of those important rivers, the Victoria and Albert, supposed to have their rise in an extensive range of mountains in the locality to be explored, and of the facilities or otherwise of connecting Carpentaria with

the southern ports, by which the dangerous navigation of the coast and of Torres Strait and the delays from monsoons will be avoided;—the importance, I say, of all this information, which we may expect to derive from this Expedition, cannot be too highly estimated, whether as regards the welfare of the people, or the vast interests which are involved in this country, with respect to that portion of our colonies.

I cannot quit the subject of this Expedition without mentioning an instance of rare liberality in the cause of geographical science which was communicated at one of our evening meetings, during this session, by Count Strzelecki. When the North Australian Expedition was first planned, and when, owing to the length of time which had elapsed before it started, it was supposed that funds were wanting to carry it out, an associate of this Society, Mr. M. Uzielli, generously offered to place the munificent sum of 10,000*l.* at its disposal. Another of our Associates, Mr. W. S. Lindsay, M.P., had also previously offered to contribute largely towards the outfit of the Expedition. As, however, the Government have taken the matter into their own hands, these gentlemen have not been called upon to fulfil their promises; but we must still look upon the offers as proofs, that the labours of the Geographical Society are fully appreciated by practical men, and of the zeal that exists among us for the advancement of geographical knowledge.

In connection with this part of my subject, I next mention a paper by our Associate Captain Stokes of the Royal Navy, on steam communication between our settlements in Australia and this country, India, and China, and on the establishment of a Penal Settlement in connection with a colony in the vicinity of the Gulf of Carpentaria. In this he proposes a new route through Torres Strait, and to render its various passages safe by the erection of lighthouses and the establishment of pilots.

The necessity for improving the navigation of Torres Strait was some months ago brought prominently forward by the great body of the shipping interests in Australia, in a memorial transmitted to this country, and communicated to Lloyd's; and there can be no doubt that the vast interests involved, demand our serious attention; for whether or not the proposed means of communication ultimately become the direct routes to and from those colonies, Torres Strait will still remain the high road of communication between India and the South Pacific Ocean, and between our Southern Australian colonies, India, and China.

*New Caledonia.*—From the *Annales de la Marine et des Colo-*



nies,' we learn that the French have made a complete investigation of New Caledonia, and have taken possession of the whole island, and caused the sovereignty of France to be acknowledged.

The loss of a Chinese junk upon D'Entrecasteaux Reef, New Caledonia, has been the occasion of bringing us better acquainted with that most dangerous reef, and with its vast extent and correct geographical position, by Lieutenant Chimmo, R.N., and with its formation and natural history by Dr. McDonald, the assistant-surgeon of H.M.S. 'Torch,' under Lieutenant Chimmo's command.

*Norfolk Island.*—You will have learned from our 'Proceedings' that Norfolk Island, in a complete state of preparation, and with all its buildings, has been appropriated to the use of the Pitcairn Islanders, who have all consented to be transferred there. The planting a colony consisting of persons of such exemplary moral conduct, and of such uniform piety, may perhaps exercise a beneficial effect upon the other islands of the Pacific within their influence.

*Bonin Isles.*—The Bonin Islands have obtained some notoriety lately, from the mention which has been made of them by Commodore Perry of the United States' Navy, who considers them to be of great importance from their geographical position, and that they may be looked upon as offering to a maritime nation a most "valuable acquisition." In an early stage of the question this officer claimed them as the property of the United States, under the impression that the group had been visited by an American citizen before the islands were formally taken possession of by myself in 1827. But having since learned from the Address of our late President, the Earl of Ellesmere, that the individual in right of whom he claimed them, was an Englishman, he has generously acknowledged that he was probably misinformed. And here I would leave the matter, except that I think it due to myself to reply to his remark, "that in naming these islands I had very unjustly overlooked the name of Coffin, who had visited the *southern* part of the group before I had." To this I have only to plead entire ignorance of Captain Coffin ever having named these islands at all, until I read the remarks of Commodore Perry.\* The right of possession from priority of discovery is a question of which nations are naturally jealous; but I trust that not only in respect of these islands, but in all other cases, our relations will be such, that our ports will be mutually open for the general benefit of navigation and commerce.

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\* Captain Coffin first communicated the position of the *southern* cluster, and bestowed his own name upon the *port*. See 'Beechey's Voyage to the Pacific,' vol. ii. p. 32.



## NEW PUBLICATIONS.

Numerous donations have been presented to the Society, including 4 atlases, upwards of 350 maps and charts, and 663 volumes and pamphlets; affording an excellent proof of the desire to bring its members acquainted with the publications of the day, and denoting a sense of the Society's usefulness. A complete list of these will be printed as usual in the Journal, and many have been specially alluded to in the course of the Address. Among the donations contributed by our own countrymen, though not at present associated with us, may be mentioned the learned work on the Chinese and their Rebellions, by Mr. Meadows, which will receive further notice in the 'Proceedings.'

Our associate, Mr. Alexander Keith Johnston, has completed the new edition of his superb Physical Atlas. The publication of the first edition of this great work, ten years since, had the effect of introducing in this country almost a new era in the popular study of geography, through its attractive and instructive illustration of the prominent features of the science. This second edition is to some extent an entirely new work, owing to the additions and improvements which have been introduced. I have only to refer to the names of Murchison, Forbes, Brewster, Ami Boué, and Berghaus, to stamp the high character of the work; but I must not omit to mention, among new contributions, the Geological Map of Europe, by Sir Roderick Murchison and Professor Nicol; that of America, by Professor Rogers; General Sabine's Map of Terrestrial Magnetism; the Distribution of Marine Animals, by the lamented Professor Edward Forbes; and the addition of a large general Index adds materially to the utility of this extensive compendium of Natural Geography.

The Imperial Atlas of Modern Geography, edited by our associate, Dr. Blackie, of Glasgow, has reached its twelfth number. The maps are very neatly and correctly executed by some of our best cartographers.

The Royal Illustrated Atlas, with an introductory notice on the existing literature of geography, by Dr. Shaw, is also in course of publication by Messrs. Fullarton, and has reached its eighth part. The design of this atlas goes beyond the ordinary scope of unadorned cartography, in combining with the maps, picturesque vignettes and illustrations of the countries and their inhabitants. The maps are prettily drawn according to the latest

authorities, and the pictures, which form an unusual, though instructive feature of the work, are neatly engraved.

I may include in this notice of our own labours, a beautiful Map of Madeira, published in London, in the English language, and dedicated, by permission, to this Society, by our Corresponding member M. Ziegler of Winterthur. The physical features of this island, including the distribution of its vegetation, are skilfully portrayed; and in addition to his own observations, Mr. Ziegler acknowledges the assistance he has derived from the labours of Captain Vidal, R.N., and Sir Charles Lyell; and especially from the communications of Mr. Hartung, whose portfolios are rich with the researches of six winters. Such a map cannot fail to prove valuable to the geographer, and an interesting companion to those who seek in Madeira for a milder climate than our own.

The successful researches which have been prosecuted among the mounds of Mesopotamia have led to the production of a series of three beautiful Maps for the Government of India, by Commander Jones, I.N., delineating the remains of Khorsabad, Nineveh, Selamiyeh, and Nimrud.

One of the latest communications received from our lamented Corresponding member, Vicomte de Santarem, contained the donation of a copy of the fac-simile published by the Vicomte of the large Map of the World drawn by Fra Mauro in 1459. This fac-simile is of the same size as the original, and published on six sheets.

Among our members who have contributed to Crimean geography may be now mentioned Mr. G. Cavendish Taylor, who has recently published a *Journal of Adventures with the British Army*, in two volumes.

One of our earliest members, General Monteith, whose Map of Georgia and the Caucasus was engraved several years since by the Society, and still remains in repute, has lately published a volume on Kars and Erzeroum, with an account of the Campaigns of Prince Paskiewitch and of the Russian Conquests beyond the Caucasus.

Mr. William Ferguson, our associate, has published his journal of a visit, entitled '*America by River and Rail, or Notes by the Way on the New World and its People.*'

Dr. J. D. Hooker and our associate Dr. Thompson have published, separately, their *Introductory Essay to the Flora Indica*, including outlines of the Physical Geography and Botany of the Provinces of India.

A fine Map has been published lately by Mr. Stanford, con-



taining the eastern frontier of the Cape of Good Hope, drawn by Mr. Henry Hall, of the Ordnance department in that colony, whose merits as a cartographer are well known. This map appears very opportunely, as it includes the country of the Bassutos, where disturbances are apprehended. Mr. Stanford has also presented a copy of the new edition of Baily's Map of Central America, with corrections from the recent surveys of Squier, Codazzi, and others.

Capt. Burton has completed the narrative of his dangerous journey to Mecca and Medina, in the disguise of an Affghan pilgrim; and he has also published an account of his visit to the African city of Harar, which had been deemed inaccessible, owing to the savage and hostile character of the chief, as well as of the people.

Our associate, Captain Charles F. A. Shadwell, R.N., C.B., has added to his useful publications on navigation a case containing, on a dozen cards, 'Formulæ of Navigation and Nautical Astronomy'; also another work on the Management of Chronometers.

The labours of other Members have been alluded to in various parts of this Address in connection with the different countries to which they relate.

#### PHYSICAL GEOGRAPHY.

During the past year there has appeared, under the direction of the zealous superintendent of the Ordnance Survey, an abstract of the operations, carried on in Ireland, for the purpose of referring the mean water levels upon various parts of the coast to a common standard. Although these observations have long been discussed by our Astronomer Royal, and will be found in the Transactions of the Royal Society, yet it is only now that the complete details of the operations have been published; and as the observations present this curious result, viz. that the mean sea level is higher upon the northern part of Ireland than upon the southern part, and as no notice of this has ever appeared in our Journal that I am aware of, I take this occasion of observing that, if we take as the standard Courtown, in Wicklow—a spot remarkable as having no perceptible rise or fall of its tide, and about midway on the axis of the great tidal wave between the extremities of Ireland—we shall find that the mean sea level stands higher on the north of Ireland (Ballycastle) by 0·881 feet and lower on the south (Castle Townsend) by 0·938 feet than it does at Courtown. I know it will be interesting to many of our Associates to have these facts inserted in their Journal.

Of late, various papers have appeared on the circulation of the waters of the ocean; and as new facts are received, the interest of the subject increases. The labours of America have in this respect been very fruitful; Lieutenant Maury, our able and newly elected Corresponding member, has laboured deeply in this field, and has shown us with what accuracy he has determined the course and velocity of the Gulf Stream, by the remarkable agreement between the real and calculated position in which the unfortunate 'San Francisco' was found, after being disabled and drifting many days in the strength of the current.

The American Surveying Expedition, under Lieutenant Lee, has also contributed to the subject; and, while pursuing its observations upon the streams of the ocean, has largely added to our store of ocean temperatures at various depths, and has furnished us with a most interesting section of the basin of the Atlantic, which will throw considerable light upon the practicability of the project of connecting the two great continents of Europe and America by a telegraphic wire.

Mr. Findlay, our Associate, has added to his former contributions on the subject of ocean streams; and Captain Irminger, of the Danish Royal Navy, has supplied us with information as to a new course of the stream on the coast of Greenland.

It has been the practice of my predecessors to notice the progress of magnetic science from the natural connection between the compass and topographical operations. During the past year a committee has been formed at Liverpool for the purpose of inquiring into that subtle subject, the disturbance of the compass in iron vessels. They have made a report of their labours, up to the end of the year, to the Board of Trade, which presents some curious and interesting results, and they are still continuing their investigations. The Board of Trade encourages this inquiry, so manifestly advantageous to the shipping interest, by an annual grant of money.

The question of local attraction in ships has also engaged the attention of our learned and indefatigable Astronomer-Royal, who has recently furnished a valuable paper on the subject to the Royal Society.

Various papers on this subject by other authors also have been published since the last anniversary, of which some have been read before the British Association at Glasgow, particularly those by Dr. Scoresby, and by Mr. Towson.

It will be interesting to know that Mr. Piazzzi Smyth, the Astro-



nomer-Royal at Edinburgh, is about to proceed to Teneriffe, to make astronomical observations on the summit of the famed Peak of Teyde.

The distinguished author of the 'Law of Storms,' Sir William Reid, has published a notice of the motion of winds and storms in the Mediterranean, and drawn a comparison between the gales and forces of the winds of Malta and of Bermuda. The work embodies a memorandum by our valued associate, Captain Graves, R.N., on the advantages which shipping will derive from pursuing a certain course in the Mediterranean, with respect to prevailing winds at certain seasons of the year.

I am happy to be able to announce the completion of an important series of observations upon the tidal streams of the seas around our own shores, which have been carried on for several years in a small vessel, which the Admiralty liberally placed at my disposal. These observations are of great importance as regards this particular branch of science, as they satisfactorily establish, in tidal waves of a peculiar character, the existence of a simultaneous turn of stream throughout the wave, notwithstanding the remarkable fact of there being a progressively increasing tidal establishment. This theory was advocated in two papers under my own hand, printed in the 'Transactions' of the Royal Society; and it has now been further confirmed by numerous observations. The result will facilitate and simplify the navigation of our channels, and will affect much that has been written upon the subject of tides.

In connection with this branch of physics, I mention a work by Mr. F. A. Keller, an able hydrographical engineer of the French navy, entitled, '*Exposé du Régime des Courants dans la Manche et la Mer Allemagne.*' The author has endeavoured to arrange the results derived from the first series of the observations, published, as before mentioned, in the Philosophical Transactions, in a manner which, he is of opinion, will render them more generally useful to mariners.

Lieutenant Maury has furnished a pamphlet on 'Lanes for Steamers,' or upon the routes which he would have steamers follow, when passing between England and America, in order to render this much frequented route more safe, by diminishing the chance of collision. In addition to lessening the danger of these passages, Lieutenant Maury points out several other advantages which would attend the adoption of his plan, and gives much useful information on the course of the Gulf Stream, as well as on districts where fogs and gales are most frequent, and the times when they most prevail.

## CONCLUSION.

I have now laid before you as much of the general outline of the state and progress of Geographical science during the past year, as may be conveniently comprised within the limits of an Address, and I feel satisfied that there is much upon which the Society may be congratulated. The numerous communications made to the Society during the Session from all parts of the globe—the animated and enlightened discussions upon them, which are recorded in our useful periodical, the ‘*Proceedings*,’ which has been so successfully started, and the enlarged dimensions which our Journal has attained under the careful editorship of our zealous Secretary, Dr. Norton Shaw—are proofs of the many and fruitful sources whence information flows to us; and when we recollect how few of our evening meetings have been passed within these walls without some positive addition to the science we cultivate, we shall be able to comprehend the progress that is continually being made in Geographical research, and the great increase of the general interest which it excites. But it is not in the pages of our records alone, that the full benefits of the Society are seen—the mere facts added, year by year, to our store of knowledge, are but the promise of the successes before us, and of benefits to be derived from our labours. It is impossible to read the list of names enrolled as members of this Society without feeling convinced that its labours are considered valuable to every interest and to men of all professions; for it is not the geographer alone who will be found thus supporting our efforts: side by side with him stand the politician and the merchant, who regard with deep interest new enterprises opened out for commerce; and next to him the divine, who foresees in the extension of our science, fresh means of spreading the blessings of Christianity, and its attendant, the civilization of man. And so I might pass on to other professions, all concurring in the same sentiments and interests. In this union of views we cannot but foresee the enlarged success of the Society; and feel that it is with no exaggerated hopes we may look forward to its steady and satisfactory progress, and to its increasing importance and usefulness.









## PAPERS READ

BEFORE THE

# ROYAL GEOGRAPHICAL SOCIETY.

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*L.—Report to the Secretary of the United States Navy, at Washington, of the Expedition in search of Sir John Franklin, during the years 1853-4-5, with a Chart, showing the Discoveries made in the Arctic Regions. By ELISHA KENT KANE, M.D., U.S.N. (Gold Medallist).*

*Read, January 14, 1856.*

*To the Hon. J. C. Dobbin, Secretary of the Navy.*

SIR,—The expedition to which I was appointed by orders from the Department, under date of the 27th of November, 1852, left New York in the brig 'Advance,' of 120 tons burden, on the 30th of May following. Our company consisted of eighteen persons in all, of whom ten were regularly attached to the naval service, the others being engaged by private liberality.

Our destination was to the highest penetrable point of Baffin Bay, from which, according to instructions from the Department, we were to attempt a search for the missing vessels of Sir John Franklin. This region was then entirely unexplored, and it was selected on that account.

The copies which I annex of my letters, heretofore addressed to the Department, indicate my course up to the time of leaving Upernavik, in lat.  $72^{\circ} 47' N.$  It will be seen from them that I engaged at that point an Esquimaux hunter and an interpreter, deeming their aid essential to the success of our expedition. I had also purchased supplies of fresh meat and fish, which were carefully dried and set aside to meet emergencies.

On reaching Melville Bay I found the shore-ices so decayed that I did not deem it advisable to attempt the usual passage along the fast floes of the land, but stood directly to the northward and westward as indicated by my log, until I met the middle pack. Here we headed nearly direct for Cape York, and succeeded in crossing the bay without injury, in ten days after first

encountering the ice. On the 7th of August we reached the headland of Sir Thomas Smith Sound, and passed the highest point attained by my predecessor, Captain Inglefield, *R.N.*

So far our observations accorded completely with the experience of this gallant officer in the summer of 1852, a fresh breeze with a swell setting in from the southward and westward, marks upon the rocks indicating regular tides, no ice visible from aloft, and all the signs of continuous open water.

As we advanced, however, a belt of heavy stream-ice was seen, an evident precursor of drift, and a little afterwards it became evident that the channel to the northward was obstructed by a drifting pack.

We were still too far to the south to carry out the views I had formed of our purposed search, and it became my duty therefore to attempt the penetration of this ice. Before doing this I selected an appropriate inlet for a provision depôt, and buried there a supply of beef, pork, and bread. At the same place we deposited our Francis' life-boat, covering it carefully with wet sand, and overlaying the frozen mass with stones and moss. We afterwards found that the Esquimaux had hunted around this inlet, but the *cache* which we had thus secured as our own resort, in case of emergency, escaped detection.

No one having yet visited this coast I landed on the most prominent western headland of a group of small islands, the Littleton Islands of Inglefield, and erected there a flag-staff and beacon. Near this beacon, according to preconcerted arrangement, we deposited official despatches and our private letters of farewell.

My first design in entering the pack was to force a passage to the North, but after reaching lat.  $78^{\circ} 45'$  we found the ice hugging the western shore, and extending in a drifting mass completely across the channel. This ice gradually bore down upon us, and we were forced to seek the comparatively open spaces of the eastern coast. Still we should have inevitably been beset, and swept to the south, but for a small land-locked bay, under whose cliffs we found a temporary asylum. We named it Refuge Inlet; it carries 50 fathoms of water within a biscuit toss of its northern headland, and but for a glacier, which occupies its inner curve, would prove an eligible winter harbour.

We were detained in this helpless situation three valuable days, the pack outside hardly admitting the passage of a boat. But on the 13th, fearing lest the rapidly advancing cold might prevent our penetrating farther, we warped out into the drift and fastened to a grounded berg.

That the Department may correctly apprehend our subsequent movements, it is necessary to describe some features peculiar to our position. The coast trended to the N.E. It was meta-



morphic in structure, rising in abrupt precipitous cliffs of basaltic greenstone from 800 to 1200 feet in perpendicular height. The shore at the base of this wall was invested by a permanent belt of ice, measuring from 3 to 40 yards in width, with a mean summer thickness of 18 feet. The ice clung to the rocks with extreme tenacity, and unlike similar formations to the south, it had resisted the thawing influences of summer. The tidal currents had worn its seaward face into a gnarled mural escarpment, against which the flocs broke with splendid displays of force, but it still preserved an upper surface comparatively level, and adapted as a sort of highway for further travel. The drifting ice, or pack outside of it, was utterly impenetrable; many bergs, recently discharged, were drifting backward and forward with the tides, and thus pressing upon the ice of the flocs, had raised up hills 60 to 70 ft. high. The mean rise and fall of the tide was 12 ft., and its rate of motion  $2\frac{1}{2}$  knots an hour.

In this state of things, having no alternative but either to advance or to discontinue the search, I determined to take advantage of a small interspace which occurred at certain stages of the tide, between the main pack and the coast, and, if possible, press through it. I was confirmed in this purpose by my knowledge of the extreme strength of the 'Advance,' and my confidence in the spirit and fidelity of my comrades.

This effort occupied us until the 1st September, and was attended by the usual dangers of ice penetration. We were upon our beam ends whenever the receding tides left us in deficient soundings; and on two of such occasions it was impossible to secure our stoves so as to prevent the brig from taking fire. We reached lat.  $78^{\circ} 43'$  on the 29th August, having lost a part of our starboard bulwarks, a quarter boat, our jibboom, our best bower anchor, and about 600 fathoms of hawser, but with our brig, in all essentials, uninjured.

We were now retarded by the rapid advance of winter; the young ice was forming with such rapidity that it became evident that we must soon be frozen in. At this juncture my officers addressed to me written opinions in favour of a return to a more southern harbour; but as such a step would have cost us our dearly purchased progress, and removed us from the field of our intended observations, I could not accede to their views. I determined therefore to start on foot with a party of observation to seek a spot which might be eligible as a starting point for our future travel, and, if such a one were found, to enter at once upon the full duties of search.

This step determined on, the command of the brig was committed to Mr. Olsen, and I started on the 29th August with a detachment to carry a whale-boat and sledge. The ice soon

checked the passage of our boat, but I left her, and proceeded with a small sledge along the ledge of ice, which, under the name of "Icefoot," I have before described as clinging to the shore.

We were obliged, of course, to follow all the indentations of the coast, and our way was often completely obstructed by discharged rocks from the adjacent cliffs. In crossing a glacier we came near losing our party, and were finally compelled to abandon the sledge and continue our journey on foot. We succeeded, however, in completing our work, and reached a projecting cape, from which, at an elevation of 1100 feet, I commanded a prospect of the ice to the n. and w. as high as lat.  $80^{\circ}$ . A black ridge running nearly due n., which we found afterwards to be a glacier, terminated our view along the Greenland coast to the eastward. Numerous icebergs were crowded in masses throughout the axis of the channel, and as far as our vision extended the entire surface was a frozen sea. The island named Louis Napoleon, on the charts of Captain Inglefield, does not exist. The resemblance of ice to land will readily explain the misapprehension.

The result of this journey, although not cheering, confirmed me in my intention of wintering in the actual position of the brig, and I proceeded immediately on our return to organise parties for the fall, with a view to the establishment of provision depôts to facilitate the farther researches of the spring. In selecting sites for these, and the attendant travel, our parties passed over more than 800 m. The coast of Greenland was traced 125 m. to the n. and e., and three *caches* were established at favourable points. The largest of these (No. 3 of Chart) contained 800 lbs. of pemmican; it was located upon an island in lat.  $79^{\circ} 12' 6''$ , long.  $65^{\circ} 25'$ , by Messrs. McGeary and Bonsall. These operations were continued until the 20th November, when the darkness arrested them.

Our brig had been frozen in since the 10th of September. We had selected a harbour near a group of rocky islets in the south-eastern curve of the bay, where we could establish our Observatory, and had facilities for procuring water, and for daily exercise. We were secure too against probable disturbance during the winter, and were sufficiently within the tidal influences to give us a hope of liberation in the spring.

As we were about to winter higher n. than any previous expedition, and, besides a probable excess of cold, were about to experience a longer deprivation of solar light, the arrangements for the interior were studied carefully.

The deck was housed in with boards, and caulked with oakum; a system of warmth and ventilation was established; our permanent lamps were cased with chimneys to prevent the accumulation of smoke; cooking, ice-melting, and washing arrangements were minutely cared for. The dogs were kennelled in squads, and they



were allowed the alternate use of snow-houses, and of the brig, as their condition might require. Our domestic system was organised with the most exact attention to cleanliness, exercise, recreation, and withal to fixed routine.

During the winter which followed, the sun was 120 days below the horizon, and owing to a range of hills towards our southern meridian, the maximum darkness was not relieved by apparent twilight even at noon day.

The atmospheric temperatures were lower than any that had been recorded by others before us. We had adopted every precaution to secure accuracy in these observations, and the indications of our numerous thermometers, alcoholic, etherial, and mercurial, were registered hourly.

From them it appears that the mean annual temperature of Van Rensselaer harbour, as we named our winter home, is lower than that of Melville Island, as recorded by Parry, by two degrees. In certain sheltered positions the process of freezing was uninterrupted for any consecutive 24 hours throughout the year.

The lowest temperature was observed in February, when the mean of eight instruments indicated minus 70° Fah. Chloroform froze, the essential oils of sassafras, juniper, cubebs, and winter green were resolved into mixed solid and liquid; and on the morning of February 24th we witnessed *chloric ether* congealed for the first time by a natural temperature.\*

In the early part of this winter I erected an astronomical observatory, and mounted our "transit" and theodolite upon pedestals of stone cemented by ice. Great care was taken by Mr. Sontag, the astronomer to the expedition, in determining our geographical position. The results for the determination of longitude, as based upon moon culminations, are in every respect satisfactory; they are corroborated by occultations of planets and the late solar eclipse of May 1855. An occultation of Saturn simultaneously observed by Mr. Sontag and myself at temperatures of  $-60^{\circ}$  and  $-53^{\circ}$  differed but two seconds. This is the lowest temperature at which such an observation has ever been taken.

The position of our observatory may be stated as in lat.  $78^{\circ} 37'$ , long.  $70^{\circ} 40' 6''$ . A room, artificially heated, was attached to the observatory as a magnetic station. The observations were both absolute and relative, and were sustained by a corps of volunteers among the officers.

A strong tendency to tonic spasm, probably induced by the lengthened cold and darkness, was the chief trial of our party.

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\* January 17th, 1834, Sir George Back's mean temperature at Fort Reliance, Great Slave Lake, was  $70^{\circ}$ .

General disease was readily controlled by a careful hygiene ; and the unremitting and intelligent exertions of Dr. J. J. Hayes, the surgeon of the expedition, kept scurvy in complete subjugation.

But this anomalous form of spasmodic disease was encountered with difficulty. It extended to our dogs, assuming the aspect of tetanus ; and in spite of every effort no less than 57 perished, many of them with symptoms not unlike those of hydrophobia.

The loss of these animals interfered seriously with my original scheme of search. They had been collected at various points of the coast of Greenland, and had been trained for their office with extreme care and labour. I had contemplated employing them in following the coast, and with this view had devoted the labours of the fall to the organization of a chain of depôts. Now, however, a new system of operations was to be established, with different appliances. New sledges were to be built, and cooking utensils and field equipments provided, suited to larger parties, and of more portable character. The latter period of darkness was entirely occupied with these new preparations.

Our party was unhappily too small for an extended system of field operations by unassisted human labour, and the only remaining hope of continuing the search was to be found in a passage through or over the great ice-fields to the N.—an effort the success of which was rendered very doubtful by the crowded bergs and distorted ice of this frozen area. With this object I organised a party of our strongest men (all volunteers), under my personal charge, and sent an advanced corps, under Mr. Brooks, the energetic first officer of the expedition, to place a relief cargo of provisions at 10 days' journey from the brig.

On the 27th of March, the ninth day of their absence, a heavy gale from the N.N.E. broke upon this party. The thermometer fell to 57° below zero, and the ice ridges (hummock lines) were so obstructed by snow-drift that they could not deposit their stores beyond 50 m. from the brig. Four of the most valuable members of the party, Messrs. Brooks and Wilson, Jefferson Baker, and Peter Schubert, were frozen at the extremities ; and a single man being left to attend them, the others returned to the brig in a state of extreme exhaustion. The name of the brave fellow who remained with his comrades was Thomas Hickey, an Irishman.

The main company, under my own command, started at once for the floes, with but little hope of rescuing our comrades. Mr. Olsen, one of the returned party, volunteered to guide us. He was sewed up in furs, and strapped upon a small sledge, which we dragged after us ; but symptoms of mental disturbance rendered his heroism unavailing ; and but for striking the trail of the party we must all of us have perished.

On this occasion I was deeply touched by the confidence of the



disabled men in the certainty of their relief. Although they were nearly concealed by snow-drift, and dependent for warmth upon their sleeping bags, they had patiently and hopefully awaited our arrival. The discovery of their small canvas tent in the midst of these immense plains of ice I must remember as providential.

I mention gratefully the endurance and self-denial of my comrades upon this fearful march. They had been 81 out of 84 hours without sleep, and had halted for the purpose of melting ice for drink. The tendency to sleep could only be overcome by mechanical violence, and when at last we got back to the brig, still dragging the wounded men instinctively behind us, there was not one whose mind was found to be unimpaired.

This disastrous effort cost us two valuable lives—Jefferson Baker and Peter Schubert. The first of these was a native of Delaware county, Pennsylvania, a trustworthy and faithful follower; he died of locked jaw thirty-six hours after his return to the brig. The other was cook to the expedition, and a volunteer upon the duty which caused his death. Our little party had throughout, from the nature of the service, been in close relations with one another, and these men are remembered by us all with sympathy and respect.

As soon after this as the health of our company could justify, I set out with my original party to renew the attempt from a higher point on the Greenland coast, carrying with me an india-rubber boat. This journey was undertaken in the latter part of April and continued into May. It was followed by others, which extended the search almost without intermission until the 10th of July. These journeys may be thus summed up:—March, Mr. Brooks and Dr. Kane; April, May, Dr. Kane, Messrs. McGeary and Bonsall; June, Dr. Hayes and William Godfrey; June, July, William Morton and Hans Heindrick, our native hunter.

The arrival of the *Esquimaux* in April enabled us to add four dogs to the three that remained of our original stock, and thus to equip a slender team. The value of these animals for Arctic ice-travel can hardly be over-estimated. The earlier journeys of March, April, and May proved incomparably more arduous and exposing than those performed with dogs, while their results were entirely disproportionate to the labour they cost us. It was invariably the case that the entire party on its return from the field passed at once upon the sick list.

Out of nearly 3000 miles of travel no less than 1100 were made by the dog-sledge, and during the fall, winter, and spring of the ensuing year (1854-55), I made in person no less than 1400 miles with a single team.

Setting out from our winter quarters, three expeditions effected the passage of the bay. 1. To the s. with Messrs. McGeary and

Bonsall along the base of a great glacier, which issued from the coast of Greenland in lat.  $79^{\circ} 12'$ .\* 2. To the s.w. by Dr. Hayes and William Godfrey. 3. To the n.w. and along the shores of a new channel by W. Morton and our Esquimaux-hunter, Hans. The original reports of these journeys, with my own observations, are now under seal and subject to the orders of the Department. I give only a summary of results, referring for particulars to the Track Chart, projected on the spot from the original field notes, which I have the honour to transmit with this Report.

Greenland reaches its farthest western point at Cape Alexander in the neighbourhood of lat.  $78^{\circ} 10'$  N., and after passing long.  $70^{\circ}$  W. of Greenwich, trends nearly due E. and W. (E.  $20^{\circ}$  N.). This northern face of Greenland is broken by two large bays, at the base of which are numerous granitoid islands, which, as you approach long.  $65^{\circ}$  W., assume the form of an archipelago. Fifteen islands were surveyed and located here. The aspect of the coast is imposing, abutting upon the water-line in headlands, from 800 to 1400 ft. high; and one range of precipice presenting an unbroken wall of 45 m. in length. Its geological structure is of the olden red sandstones, and silurian limestones overlying a primary basis of massive syenites. The sandstones to the S. of  $78^{\circ}$  seem to form the floor of the bay. They are in series with intercalated greenstones and other ejected plutonic rocks, and form the chief girders of the coast. Upon this and collateral subjects I shall, with your permission, address a special report to the Department.

The farther progress of our parties towards the Atlantic was arrested by a great glacier, which issued in lat.  $79^{\circ} 12'$  N., long.  $64^{\circ} 20'$  W., and ran directly N. This forms an insuperable barrier to exploration in this direction. It is continuous with the *mer de glace* of interior Greenland, and is the largest true glacier known to exist. Its great mass adapts itself to the configuration of the basis-country which it overlies. Its escarpment, abutting upon the water, presents a perpendicular face, varying from 300 to 500 ft. in height.

The lines of crevasse and fracture are on an unexampled scale of interest. The bergs, which are ejected in lines, arrange themselves in a sort of escalade, which confers a character of great sublimity upon the landscape.

It was followed along its base and traced into a new and northern land trending far to the W. This land I have named *Washington*. The large bay which separates it from the coast of Greenland and the glacier I have described bears on my chart the name of our liberal countryman and contributor to the expenses of the expedition, Mr. George Peabody.

\* A copy of this glacier, as surveyed by me in 1855, accompanies this Report.



The coasts of this new territory adjoining Peabody Bay have been accurately delineated by two parties, whose results correspond. Its south-western cape is in lat.  $80^{\circ} 17'$ , by observation with artificial horizon. Its longitude, by chronometer and bearings, is  $66^{\circ} 42'$  w. of Greenwich. The cape was doubled by William Morton and our Esquimaux with a team of dogs, and the land to the N. traced until they reached the large indentation named Constitution Bay. The whole of this line was washed by open water, extending in an iceless channel to the opposite shores on the W. This western land I have inscribed with the name of Henry Grinnell.

The course of this channel at its southern opening was traced by actual survey in a long horseshoe curve, sharply defined against the solid ice of Smith Sound, and terminating at its extremes against two noble headlands about 40 m. apart. The western coast was followed in subsequent explorations to a mural face of 900 ft. elevation, preserving throughout its iceless character. Here a heavy surf, beating directly against the rocks, checked our future progress.

This precipitous headland, the farthest point attained by the party, was named Cape Independence. It is in lat.  $81^{\circ} 22'$  N., and long.  $65^{\circ} 35'$  W. It was only touched by William Morton, who left the dogs and made his way to it along the coast. From it the western coast was seen stretching far towards the N. with an iceless horizon and a heavy swell rolling in with white caps. At a height of 240 ft. above the sea this great expanse still presented all the appearance of an open and iceless sea. In claiming for it this character I have reference only to the facts actually observed, without seeking confirmation or support from any deduction of theory. Among such facts are the following:—

1. It was approached by a channel entirely free from ice, having a length of 52 and a mean width of 36 geographical m.
2. The coast ice along the water-line of this channel had been completely destroyed by thaw and water action, while an unbroken belt of solid ice, 125 m. in diameter, extended to the S.
3. A gale from the N.E. of 54 hours in duration brought a heavy sea from that quarter without disclosing any drift or other ice.
4. Dark nimbus-clouds and water-sky invested the north-eastern horizon.
5. Crowds of migratory birds were observed thronging its waters.

Two islands on the threshold of this sea, the most northern islands known, bear the names of Sir John Franklin and his associate, Capt. Crozier, the leaders of the gallant party of which we had been in search.

To the north-west, the coasts became mountainous, rising in truncated cones like the Magdalena cliffs of Spitzbergen. The farthest distinctly sighted point was a lofty mountain bearing N.  $5^{\circ}$  E. (solar); its latitude by estimate and intersection  $82^{\circ} 30'$ . Its longitude as thus determined would give  $67^{\circ}$  W. (approximative).

I would suggest for it the name of the late Sir Edward Parry, who, as he has carried his name to the most northern latitude yet reached, should have, in this the highest known northern land, a recognition of his pre-eminent position among Arctic explorers.

The extension of the American coast to the south-west as it appears upon the chart, was the work of Dr. Hayes and William Godfrey, renewed and confirmed by myself in April of the present year. It completes the survey of the coast as far as Cape Sabine of Captain Inglefield. The land is very lofty, sometimes rising at its culminating peaks to the height of 2500 ft. The travel along the western and north-western coast was made for the most part upon the ice-foot. One large bay in lat.  $79^{\circ} 40'$ ,\* long.  $73^{\circ}$  by estimate, extended many miles into the interior, and was terminated by a glacier. A large island occupies the south-western curve of that bay.

A summary of the operations of the parties will therefore comprehend—

1. The survey and delineation of the north coast of Greenland to its termination by the great glacier.
2. The survey of this glacial mass and its extension northward into the new land named Washington Land.
3. The discovery of a large channel to the north free from ice and leading into an open and expanding area equally free. The whole embraces an iceless area of 4200 m.
4. The discovery and delineation of a large tract of land forming the extension northward of the American continent.
5. The completed survey of the American coast to the south and west as far as Cape Sabine, thus connecting our survey with the last determined position of Captain Inglefield, and completing the circuit of the Straits and bay heretofore known at their southernmost opening, as Smith Sound.

The summer of 1854 had brought with it few changes, bearing towards the liberation of our brig. The melted snows did not run in the water-channels until the 30th of June, and our limited Flora showed a tardy and inauspicious season.

On the 12th of July the ice being still unbroken as far as Anaktok, I set out in a whale-boat with five volunteers to commu-

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\*  $79^{\circ} ?$ —Ed.



nicate, if possible, with our English brethren whom we supposed to be at Beechey Island. The declining state of our resources suggested this attempt, although it promised many difficulties.

It occupied us until the 6th of August. We found a solid pack extending from Jones to Murchison Sounds, between Clarence Head and Northumberland Island. To the w. the ice still invested the American shore, extending some 20 m. from Cape Isabella. Between this and Mittie Island was a solid surface, the curved shore line occupied by an extensive glacier.

After endeavouring several times to bore we were forced to make Hakluyt Island on the Greenland side, and landed there to rest and renew our stock of provisions. The pack still filled the channel between that island and Cape Parry; and it was only with extreme effort that we were able to carry our boat over the ice. We had approached in this manner within 10 m. of the latter point, when seeing no chance of success, the winter rapidly advancing upon us, I reluctantly gave orders for our return to the brig. During this journey, which was full of exciting contingencies, we passed over the track of Bylot and Baffin, the explorers of 1616.

Our preparations for the second winter were modified largely by controlling circumstances. The physical energies of the party had sensibly declined. Our resources were diminished; we had but 50 gallons of oil saved from our summer's seal hunt. We were scant of fuel, and our food, which now consisted only of the ordinary marine stores, was by no means suited to repel scurvy. Our molasses was reduced to 40 gallons, and our dried fruits seemed to have lost their efficiency.

A single apartment was bulkheaded off amidships as a dormitory and abiding room for our entire party, and a moss envelope cut with difficulty from the frozen cliffs made to enclose it like a wall. A similar casing was placed over our deck, and a small tunnelled entry—the tossut of the Esquimaux—contrived to enter from below. We adopted as nearly as we could the habits of the natives, burning lamps for heat, dressing in fox-skin clothing, and relying for our daily supplies on the success of organized hunting parties.

The upper tribes of these Esquimaux had their nearest winter settlement at a spot distant by dog-journey about 75 m. We entered into regular communication with this rude and simple-minded people, combining our efforts with theirs for mutual support and interchanging numerous friendly offices. Bear-meat, seal, walrus, fox, and ptarmigan were our supplies: they were eaten raw, with a rigorous attention to their impartial distribution.

With the dark months, however, these supplies became very scanty. The exertions of our best hunters were unavailing; and my personal attempts to reach the Esquimaux failed, less on

account of the cold (minus  $52^{\circ}$ ) than the ruggedness of the ice, the extreme darkness, and the renewal of tetanic diseases among our remaining dogs. Our poor neighbours, however, fared worse than ourselves: famine, attended by frightful forms of disease, reduced them to the lowest stages of misery and emaciation.

Our own party was gradually disabled. Mr. Brooks and Mr. Wilson, both of whom had lost toes by amputation, manifested symptoms of a grave character. William Morton was severely frozen, and we were deprived of the valuable services of the surgeon by the effects of frost bite, which rendered it necessary for him to submit to amputation. Scurvy with varying phases gradually pervaded our company, until Mr. Bonsall and myself only remained able to attend upon the sick, and carry on the daily work of the ship—if that name could still appropriately designate the burrow which we inhabited. Even after this state of things had begun to improve, the demoralizing effects of continued debility and seemingly hopeless privation were unfavourably apparent among some of the party. I pass from this topic with the single remark, that our ultimate escape would have been hazarded, but for the often painfully enforced routine, which the more experienced among us felt the necessity of adhering to rigorously under all circumstances.

In the latter part of March, the walrus again made their appearance among the broken ice to the south, and we shared with the Esquimaux the proceeds of the hunt. The hæmorrhages which had much depressed our party subsided, and we began slowly to recover our strength. The sun came back to us on the 21st of February, and by the 18th of April the carpenter and several others were able to resume their duties.

In view of contingencies which I had long apprehended, I found it necessary at last to abandon the brig. We had already consumed for firewood her upper spars, bulwarks, deck sheathing, stanchions, bulk heads, hatches, extra strengthening timbers;—in fact everything that could be taken without destroying her sea worthiness. The papers which I append show the results of the several surveys made at this time by my orders. It will be seen from them, that we had but a few weeks' supply left of food or fuel; that the path of our intended retreat was one solid plain of ice, and that to delay a third winter, while it could, in no way, promote the search after Sir John Franklin, would prove fatal to many at least of our party.

Our organization for the escape was matured with the greatest care. Three boats, two of them whale-boats, 24 feet in length, and the third a light cedar dingy of 13 feet, were mounted upon runners, cut from the cross beams of the vessel, and bolted to prevent the disaster of breakage. These runners were 18 feet



in length and shod with hoop iron. No nails were used in their construction: they were lashed together so as to form a pliable sledge; and upon it the boats were cradled, so as to be removable at pleasure.

A fourth sledge with a team of dogs was reserved for the transport of our sick, four of whom were still unable to move, and for carrying on our stock of provisions. An abandoned Esquimaux hut, about 35 miles from the brig, was fitted up as well as our means permitted, to serve as an *entrepôt* of stores and a wayside shelter for those of the party who were already broken down, or might yield to the first trials of the journey.

The cooking utensils were made from our old stove-pipe. They consisted of simple soup boilers, enclosed by a cylinder to protect them from the wind. A metal trough to receive fat, with the aid of moss and cotton canvas, enabled us to keep up an active fire. My provisions were packed in waterproof bags, adapted in shape to the shear of the boats, and in no case rising above the thwarts. They consisted, with the exception of tea, coffee, and small stores for the sick, exclusively of melted fat and powdered biscuit.

The clothing was limited to a fixed allowance. Mocassins for the feet were made of our woollen carpeting, which had been saved for the purpose; and numerous changes of dry blanketsocks were kept for general use. For bedding, our buffalo robes were aided by eider down, quilted into coverlids; the experience of former travel having assured me that, next to diet and periodical rest, good bedding and comfortable footgear were the most important things to be considered.

I took upon myself the office of transporting the sick and our reserve of provisions, employing for this purpose a dog-sledge and our single team of dogs. I carried down my first load of stores in April, and on the 15th of May began the removal of the sick. By the middle of June, all our disabled men and some 1200 lbs. of stores had in this manner been transferred by a series of journeyings equal in the aggregate to 1100 miles.

On the 17th of May, having authenticated by appropriate surveys the necessities of our condition, and made all our preparations for the journey, the sledge-boats left the vessel, dragged by the officers and men under the immediate charge of Mr. Henry Brooks, an appointment which he fulfilled with unswerving fidelity and energy.

My collections of Natural History were also carried as far as the sick station at Anoatok; but under a reluctant conviction that a further effort to preserve them would risk the safety of the party, they were finally abandoned. It is grateful to me to recollect the devotion of my comrades, who volunteered to sacrifice shares of both food and clothing to secure these records of our labours.

We were able, not without difficulty, to carry on our chronometers, and the various instruments, magnetic and others, which might allow me still to make and verify our accustomed observations. We left behind the theodolite of the United States Coast Survey and the valuable self-registering barometric apparatus furnished by the American Philosophical Society. Our library, including those portions which had been furnished by the Government and by Mr. Grinnell, as well as my own, were necessarily sacrificed. We preserved only the documents of the expedition.

The first portions of our journey filled me with misgivings, as the weakness of the party showed itself in dropsical swellings and excessive difficulty of respiration. In spite of a careful system of training, the first exposure to temperatures ranging about zero and below it, was to an invalid party extremely trying; and for the first eight days, the entire distance accomplished from the ship did not exceed 15 m. Although the mean rate of transportation was afterwards increased, it never exceeded  $3\frac{1}{2}$  m. a day over ice. Some idea may be formed of the nature of this journey from the fact that every  $3\frac{1}{2}$  m. thus attained, cost us from 12 to 15 m. of actual travel.

To sustain the party by the aid of fresh food required dog-journeys to the South settlements of the Esquimaux, distant from us about 75 m. I found it necessary also to return from time to time to the brig with the view of augmenting our supplies. My last visit to her was on the 8th of June, for the purpose of procuring some pork to serve for fuel. She was then precisely as when we left her on the 17th of May, immovably frozen in, with 9 ft. of solid ice under her bows. We availed ourselves of the occasional facilities which these visits allowed us to increase our stock of bread, of which we succeeded in baking 480 lbs.

Continuing our southern progress, we neared Littleton Island. Our sick, first left at Anoatok, were gradually brought down to the boats, as some of them gained strength enough to aid in the labour of dragging. The condition of the ice, as it became thinner and decaying, made this labour more difficult, and in the course of our many breaks through, several of the party narrowly escaped being carried under by the tides. In the effort to liberate our sledges from the broken ice after one of these accidents, acting-carpenter Olsen received an internal injury: paralysis of the bladder was rapidly followed by tetanic symptoms, and he died on the 12th of June, three days after his attack. He has left behind him a young wife, who depended entirely upon him for support. He was buried upon Littleton Island, opposite a Cape which bears his name.

From this stage of our journey up to the time of reaching the first open water, which was near Cape Alexander, we were com-



forted by the friendly assistance of the Esquimaux of *Etah*. These people faithfully adhered to the alliance which we had established during the winter. They brought us daily supplies of birds, helped us to carry our provisions and stores, and in their daily intercourse with us exhibited the kindest feeling and most rigid honesty. When we remembered that they had been so assuming and aggressive upon our first arrival that I was forced to seize their wives as hostages for the protection of our property, their present demeanour was not without its lesson. Once convinced of our superiority of power, and assured of our disposition to unite our resources with theirs for mutual protection and support, they had relied upon us implicitly, and strove now to requite their obligations towards us by ministering to our wants.

We left them on the 18th of June at the margin of the floe. In 31 days we had walked 316 m., and had transported our boats over 81 m. of unbroken ice. The men, women, and children of the little settlement had also travelled over the ice to bid us good-bye, and we did not part from them without emotion.

The passage between this point and one 10 m. s.w. of Hakluyt Island was in open water. It was the only open water seen north of Cape York, in lat.  $75^{\circ} 59'$ . We ran this under sail in a single day, hauling upon the ice to sleep. This ice was a closed pack, hanging around the north and south channels of Murchison Sound, and seemingly continued to the westward. The land-ices were still unbroken, and we were obliged to continue our journey by alternate movements over ice and water. So protracted and arduous were these that, between the 20th of June and the 6th of July, we had advanced but 100 m.

Our average progress was about 8 m. a day, stopping for our hunting parties and for sleep. Great care was taken not to infringe upon the daily routine. We had perpetual daylight; but it was my rule, rarely broken even by extreme necessity, not to enter upon the labours of a day until we were fully refreshed from those of the day before. We halted regularly at bedtime and for meals; the boats, if afloat, were drawn up; the oars always disposed on the ice as a platform for the stores; our buffalo skins were spread, each man placed himself with his pack according to his number; the cook for the day made his fire, and the ration, however scanty, was formally measured out. Prayers were never intermitted and very seldom grace before meals. I believe firmly, that to these well-ordered observances we are largely indebted for our final escape.

As we moved onward we were forced to rely exclusively on our guns for a supply of food. We suffered when off the coast immediately n. of Wolstenholme Sound, from a scarcity of game, and were subjected to serious illness in consequence. But at Dal-

rymple Island, a little farther a., we recruited rapidly on eggs of the eider-duck, and from this point to Conical Rock we found birds in abundance. Again, at the most uncertain period of our passage, when our stock of provisions was nearly exhausted, we were suddenly arrested in our course by high and rugged land-ice, which hugged a glacier near Cape Dudley Digges. We were too weak to drag our boats over this barrier, and were driven in consequence to land under the cliffs. To our joyful surprise we found them teeming with animal life. This transition from enfeebling want to the plenty which restored our strength, we could not but attribute to the direct interposition of Providence. The Lumme (*Uria Brunichii* et *Troili*) was the fowl which we here found in greatest numbers. We dried upon the rocks about 200 lbs. of its meat, which we carefully saved for the transit of Melville Bay.

The rest of the coast, except under the glaciers, was followed with less difficulty. We found peat of good quality and plenty of food. Our daily allowance of birds was 12 to a man; they were boiled into a rich soup, to which we added a carefully-measured allowance of 6 oz. of bread.

On the 21st we reached Cape York, and, finding no natives, made immediate preparations for crossing Melville Bay. An extended view showed the land-ice nearly unbroken, and a large drift of pack to the southward and westward. A beacon-cairn was built, and strips of red flannel fastened to a flag-staff so placed as to attract the attention of whalers or searching parties. I deposited here a notice of our future intentions, a list of our provisions on hand, and a short summary of the discoveries of the cruise.

Up to the 26th of July, our traverse of Melville Bay was along the margin of the land-ice, with only twice a resort to portage. We came then upon comparatively open drift, extending to the southward and westward, which, after mature consideration, I determined to follow. There were arguments in favour of a different course, perhaps for the time less hazardous, but the state of health among my comrades admonished me that it was best to encounter the risks that were to expedite our release. The reduced bulk of our stores enabled us now to consolidate the party into two boats, breaking up the remaining one for fuel, of which we were in need. Our lengthened practice of alternating boat and sledge management, had given us something of assurance in this mode of travel, and we were besides familiarized with privation. It was a time of renewed suffering, but in the result we reached the n. coast of Greenland, near Horse Head, on the 3rd of August; and following thence the inside passage, arrived on the 6th at Upernivik, 83 days after leaving the 'Advance.' We did not intermit our observations by Sextant and Artificial-horizon, as we came down the



bay, and succeeded in adding to our meteorological and magnetic registers. These, including a re-survey of the coast as laid down in the Admiralty charts, will be included in a special report to the Department.

We were welcomed at the Danish Settlements with characteristic hospitality. The chief trader, Knud Gelmeyden Fleischer, advanced to us from the stores of the Royal Greenland Trading Company at Upernavik whatever our necessities required; and when we afterwards reached Godhaven, the seat of the Royal Inspectorate, Mr. Olrik, the inspector, lavished the kindest attentions upon our party.

We had taken passage at Upernavik in the Danish brig 'Marianne,' then upon her annual visit to the Greenland Colonies, Captain Amandsen, her very courteous and liberal commander, having engaged to land us at the Shetland Isles on his return route to Copenhagen; but touching for a few days at Disco, we were met by the vessels which had been sent after us under the command of Lieutenant Hartstene. I have no words to express the gratitude of all our party towards that noble spirited officer and his associates, and towards our countrymen at home, who had devised and given effect to the expedition for our rescue.

I have the honour to be,

Very respectfully, Sir,

Your most obedient servant,

(Signed) E. K. KANE.

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No. I.

(Copy.)

*Hon. Secretary of the Navy, Washington.*

Fiskenaes, South Greenland, July 6, 1853.

SIR,—We reached this place on the 5th instant, after a run of twelve days from St. John's, Newfoundland.

By means of special facilities extended to our expedition by the Danish Government, we have been able to obtain from the Royal Greenland Company supplies of fresh dried cod-fish, as also a native Esquimaux as hunter. This boy will take with him his kyak, and is expected to prove of essential service.

We have as yet encountered no ice. It is my intention to stop at Sukkertoppen to purchase reindeer skins.

E. K. K.

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No. II.

(Copy.)

Upernavik, North Greenland, July 24, 1853.

SIR,—I have the honour to report the safe arrival of myself and party at Upernavik.

Being much delayed by calms, I deemed it unadvisable to stop at Godhaven,

but have lost no time in proceeding north. Our full complement of dogs is now on board, and we leave in a few hours for Melville Bay.

I have engaged the valuable services of Mr. Carl Johan Petersen, late interpreter to Captain Penny's expedition of search. If we should meet the Esquimaux north of Cape Alexander, he will be essential to our party.

The officers and men are in excellent health and spirits.

E. K. K.

### No. III.

(Copy.)

Deposited in Cairn, lat.  $78^{\circ} 24'$  N., Aug. 7, 1853.

SIR,—I have the honour to report our successful transit of Melville Bay and safe arrival within the waters of Sir Thomas Smith Sound.

This letter will be deposited in a cairn on Littleton Island, in latitude  $78^{\circ} 24'$  N. The prospects of a farther progress have led me to leave near this spot a metallic life-boat, with a supply of stores, as a means of retreat, should our vessel be imprisoned in the ice.

The course of our party will be from this date along the coast of Greenland, trending to the north and east. If a possible chance presents itself of forcing the brig into a northern sea, I will endeavour, before availing myself of such a chance, to leave another cairn announcing my point of departure.

Our officers and men are in excellent health and spirits, and no cases have yet occurred of scurvy or other serious disease.

After the brig is obliged to go into winter-quarters, I intend to start with a carefully equipped party to establish a depot for the final labours of next season.

Our dogs are in admirable condition, and well broken to harness.

E. K. K.

### II.—*Letter from Chief Factor JAMES ANDERSON, to Sir George Simpson, F.R.G.S., Governor in Chief of Rupert Land.*

Communicated by the HUDSON BAY COMPANY.

Read, January 28, 1856.\*

*Fort Resolution, Sept. 17, 1855.*

SIR,—I beg to state for your information that the expedition you were pleased to entrust to my command returned here last night.

After having descended Back's Great Fish River, and explored the mainland and islands as far as Maconochie Island, undoubted traces of the missing party were found at Montreal Island; but, I regret to say, that neither the remains of our unfortunate countrymen, nor any persons', were discovered. My previous despatches would have informed you that I arrived at Fort Resolution late on the 20th June: the three canoes, built under the superintendence of Messrs. Stewart and Ross, were all ready; they were of an excellent model, the woodwork very strong, but the bark, though

\* See Map to Sir George Back's paper in vol. vi. p. 1, of 'Journal of Royal Geographical Society.'—Ed.



the best that could be procured at so short a notice, was very inferior. They were, of course, very heavy; their ladings amounted to 24 pieces of 90 pounds each, and consisted chiefly of provisions, with a good supply of ironworks, &c., for the Esquimaux; ammunition nets, Halket boat, and the luggage of the party. Double sets of poles, paddles, and lines, were also provided. Fifteen men and an Indian guide to Sussex Lake composed the crews; but I found we were too weakly manned, and added three Yellow-Knife Indians, who wished to go to their lands. The only thing wanting was an Esquimaux interpreter.

Late on the evening of the 22nd June the expedition made a move to an island about one mile from the fort. Heavy gales from the N.E. detained us between there and Rocky Point, where the traverse is taken, to the 27th; these, however, cleared our road of ice. On the 28th we encamped at the upper end of Tal-thel-leh Strait, we then fell in with the ice; it was about 2 ft. thick. We were employed till the morning of the 2nd July in making our way through it, by cutting, pushing the pieces apart, and making portages over the points of land. Young ice formed every night, and the further we advanced the sounder it got; the canoes, too, unavoidably received some injury.

At that date we had reached the place called "the Mountain," in Back's map, and mentioned in his narrative as being a route to the barren grounds, but only practicable for small Indian canoes. The guide engaged by Mr. Stewart was unacquainted with this route; he proposed taking us by a river, falling into Great Slave Lake on its eastern shore, nearly opposite to Fort Reliance; by means of this river, some lakes, and ten portages, he intended to round the head of Great Slave Lake, and fall eventually at the Beaver Lodge, in Artillery Lake.

Hoar Frost River, which Sir George Back ascended with difficulty in a half-sized light canoe in the autumn, would have been at this season impracticable. To get through the ice to either of these rivers would have occupied a long time; and then Artillery, Clinton Colden, and Aylmer Lakes were still before us; it was clear that if some other route were not adopted the expedition would fail. Here was our only chance. One of the Indians had passed by this route as far as the river falling into the upper end of Aylmer Lake; he gave a disheartening description of the difficulties to be surmounted, and the high range of mountains before me was anything but encouraging. I, however, determined on making the attempt, as the route was so much shorter, and we might also expect to have a long stretch of open water on Lake Aylmer at the mouth of the river.

Immediately after breakfast the portage was begun, and though four trips were made before we encamped, the canoes and ladings

were carried over  $3\frac{1}{2}$  miles of mountains, and across a small lake ; at 10 $\frac{1}{2}$  P.M. our fine fellows were descending a steep mountain with the canoes, singing "La Violette." The next day's work was something similar, the third was a little better ; after which the mountains subsided to gentle hills, and the lakes were larger ; some of them from 20 to 40 miles in length. In short, after passing through twenty-four lakes and twenty-five portages we reached the river falling into Lake Aylmer (which I have called Outram River, after a gallant relative) late on the 7th July. Two easy rapids, and about 12 miles of river, brought us to Lake Aylmer.

I had now to trust to my own guidance. As I had anticipated, we found the lake at its mouth free from ice, and had fine paddling for about 30 miles. When we fell in with the ice the whole lake appeared solid and unbroken : the ice was about 3 ft. thick, and perfectly sound.

The north side of the lake which we followed is indented with deep bays, separated from each other by narrow necks of land ; round these, and close to the shore, we had to work our way by cutting, polling, and numerous portages across points, with occasional pieces of open water at the bottom of the bays. There were also some "crevasses" through which we passed at a great risk of being nipped : we had several hair-breadth escapes ; indeed one of the canoes was once, only saved by pushing poles under her bottom and allowing her to be lifted on the ice. We finally arrived, with our canoes much injured, at Sand Hill Bay, on the 11th July.

We had now the advantage of Sir G. Back's Map and Narrative ; the former—the one attached to his book—was on far too small a scale for our purpose ; but the latter was of great service.

It is needless for me to describe the descent of this dangerous river, after the minute and correct description of our gallant predecessor. Notwithstanding the exquisite skill of our Iroquois Boutes,\* the canoes were repeatedly broken and much strained in the whirlpools and eddies. The river to the small lake falling into Musk-Ox Lake was nearly dry, and the portage work was most severe.

On the 13th July Musk-Ox Rapid was reached : here we found a few Yellow-Knife Indians.

Our four Indians and one man were left here ; the latter, with one of the Indians, was to return to Great Slave Lake to join Mr. Lockhart, and the expedition now consisted of Mr. Anderson, Mr. Stewart, and fourteen men.

On the 15th, the worst canoe, which was completely worn out, was left, and we now proceeded with heavier ladings but better

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\* "Boutes," or bowmen, the most important men in a canoe.—J. R.



crews. On the 20th the first Esquimaux were seen at the mouth of, and below, Mackinlay River; there were five lodges, and we visited two of them: we here found the want of an interpreter. We had two of Dr. Rae's men, who understood a few words and phrases, and, with the aid of signs, they made us understand that they came down Mackinlay River. They were not much alarmed, and we soon got excellent friends.

They had evidently seen whites, or had communication with others, of their countrymen (most probably those who resort to Churchill) who had intercourse with them, as they possessed a few of our daggers, beads, files, and tin kettles; and one old man brought down some wolf-skins to barter: they were clothed entirely in deer and musk-ox skins. Their canoes were made of deer-parchment, and not a piece of seal skin was seen among them.

Another small party was seen at the rapid between lakes Pelly and Garry. The men appeared to be all absent, and the women and children fled on seeing us. Some small presents were left in the lodges to show our kindly intentions.

In Lake Garry we had to work through about 15 miles of ice; but although ice was observed in some of the other lakes, we met with no farther obstruction from this cause.

On the 30th, at the Rapids below Lake Franklin, three Esquimaux lodges were seen on the opposite shore, and shortly after, an elderly man crossed to us. After the portage was made we crossed over, and immediately perceived various articles belonging to a boat, such as tent-poles and kayak-paddles made out of ash-oars, pieces of mahogany, elm, oak, and pine; also copper and sheet-iron boilers, tin soup-tureens, pieces of instruments, a letter *nip*, with the date 1843; a broken hand-saw, chisel, &c. Only one man was at the lodges, but the women, who were very intelligent, made us understand, by words and signs, that these articles came from a boat, and the white men belonging to it had died of starvation.

We, of course, by showing them books and written papers, endeavoured to ascertain if they possessed any papers, offering to give them plenty of the goods we had with us for them; but though they evidently understood us, they said they had none: they did not scruple to show us all their hidden treasures. Besides the man, there were three women and eight children, the remainder of this party. Two men and three lads were seen towards evening.

Point Beaufort was reached on the 31st; we were detained there the next day till 2½ p.m. by a s.w. gale; we then took the traverse to Montreal Island; to seaward the ice appeared perfectly firm and unbroken.

When about 3 miles from the island a large stream of ice was observed coming at a great rate before the wind and tide out of Elliot Bay, and the other deep bays to the westward. Every sinew was stretched to reach the land, but we were soon surrounded by ice, and for some time were in most eminent danger. The ice was from 6 to 7 ft. thick, perfectly sound, and drifting at the rate of 5 or 6 m. an hour. In 15 minutes after we had passed, the whole channel to Point Beaufort was choked with ice. Had we not succeeded in crossing on this day we should have been detained on the eastern shore till the 10th.

We had thus arrived at the first spot indicated by my instructions, on precisely the same day as our gallant predecessor, Sir G. Back.

The two next days were devoted by the entire party to the examination of the island, and the small islands in its vicinity. On a high ridge of rocks, at the s.e. point of the island, a number of Esquimaux caches were found, and, besides seal oil, various articles were found belonging to a boat or ship—such as a chain-hook, chisels, blacksmith's shovel, and cold chisel, tin oval boiler, a bar of unwrought iron about 3 ft. long, 1½ broad, and ¼ in. thick; small pieces of rope, bunting, and a number of sticks strung together, on one of which was cut Mr. Stanley, surgeon of 'Erebus.' A little lower down was a large quantity of chips, shavings, and ends of plank of pine, elm, ash, oak, and mahogany, evidently sawed by unskilful hands; every chip was turned over, and on one of them was found the word 'Terror' carved. It was evident that this was the spot where the boat was cut up by the Esquimaux. Not even a scrap of paper could be discovered, and though rewards were offered, and the most minute search made over the whole island, not a vestige of the remains of our unfortunate countrymen could be discovered.

On the 5th we succeeded in crossing over to the western mainland, opposite to Montreal Island, and the whole party was employed in making a most minute search, as far as the point of Elliot Bay, and also to the northward. As the whole inlet was full of ice which had not yet moved, but was only split into immense fields by the rising and falling of the tide, we could only proceed close in shore at high tide, when by pushing small blocks apart, finding pieces of open water at the bottom of the bays, and navigating through channels of water on the ice, we reached Point Pechell, late on the 6th. The whole coast between Montreal Island and Point Pechell was searched by a land party, always accompanied by Mr. Stewart or myself; many very old Esquimaux encampments were seen, but not a trace of the party.

By this time our canoes had received so much damage, and were so weak and leaky, that it was evident the safety of the party



would be hazarded, were they subjected to more rough usage. The ice too, here, was forced on the shore, and there was no prospect of our being able to get through it. I therefore determined to complete the search of the peninsula on foot.

Early on the 7th the entire party, with the exception of two of the Iroquois, who were left to repair the canoes, started in light marching trim, taking the Halket boat with us. Five men followed all the sinuosities of the coast, while the others were spread at equal distances inland, Mr. Stewart and myself taking the middle space. Shortly after leaving the encampment a river was forded; this must be a large stream at a high stage of water. It was called Lemesurier river, after a relative of Mr. Stewart's. No fuel was found in our encampment, and in two hours we left all signs of vegetation behind; the remainder of the peninsula is composed of high sand hills, intersected by deep valleys, evidently overflowed at spring tides and during gales.

We encamped late opposite Maconochie Island, and the only vestige of the missing party found was a small piece of codline and a strip of striped cotton about 2 in. long and 1 in. broad—these were found at Point Ogle, in an Esquimaux encampment, of perhaps three or four years of age.

Next morning a piece of open water enabled us to launch the Halket boat and explore Maconochie Island, but nothing was found. It was impossible to cross over to Point Richardson as I wished, the ice driving through the strait between it and Maconochie Island at a fearful rate.

About three in the afternoon we began to retrace our steps through a tremendous storm of wind and rain. The last of the party did not reach the encampment till past ten at night, and as there was no fuel we were obliged to creep under our blankets thoroughly wet, and with no other supper but a piece of cold and rather ancient pemmican. It was now evident that all that could be done with our means had been accomplished, and that with our frail craft, any delay in returning would compromise the safety of the whole party. It may be thought strange that the remains of so large a party could not be discovered. It is my opinion that a party in a starving condition would have chosen a low spot where they could haul their boat up and have had some shelter, and that if they perished there that their bones have been long since covered by sand or gravel forced up by the ice. Any books or papers left open would be destroyed by the perpetual winds and rain in this quarter in a very short space of time; for instance, a large book, Raper's *Navigation*, was left open on a cloak at Montreal Island; it was blown open, and the leaves were pattering about in such a way, that had it not been instantly closed it would soon have been torn in pieces.

No party could winter on this coast. In the first place there is not enough fuel, and, secondly, no deer pass. About 100 deer, mostly bucks, were seen on Adelaide Peninsula, on our way to Point Ogle, but not one on our way back. Their tracks were all seen going to the south. On the eastern coast only 5 deer were seen. It would also be a matter of immense difficulty to get sufficient supplies down Fish River for even a small party.

On the 10th August a shift of wind enabled us to cross over to Point Beaufort without injury, and a gale brought us to Point Backhouse at 10½ P.M.

The Esquimaux were still at the rapids of Lake Franklin. Another attempt was made to see if they possessed papers of any description: the contents of our trading cases were offered for any. They showed us all their cachés, but nothing of interest was discovered.

The fishery of fresh-water herring and trout appeared to be over, as those we saw hanging to dry on our way down were all stowed away securely in caches, and the party were on the eve of departure to hunt deer.

Handsome presents were made to them, for which we got boots for the most of the men. The upper Esquimaux were also seen and treated in a similar manner.

The weather, during the whole trip up, was dreadful, blowing continually with rain, snow, and hail, and it froze sharply below and above Lake Beechey; our canoes also were very frail and leaky. There was still less water in the upper part of the river than on our way down; from the lake above Musk Ox Lake to Lake Aylmer was almost one continuous portage. That lake was reached early on the 31st August.

Our progress through the lakes was much retarded by strong head-winds and fogs; some time was also lost in finding the very narrow and hidden outlets of Lake Aylmer and Clinton Colden; at the latter island I was disappointed at not finding Indians. Early on the 9th we reached a bay at the end of Artillery Lake, on the east shore, near the head of the Aheldessy. It was impossible to descend that river, and we were employed the remainder of the day in discovering an Indian road to Great Slave Lake, through a series of small lakes and a small river. After passing through eight small lakes, and making as many portages, we reached the river, and soon after got sight of Slave Lake. A portage of 5 miles was made with the pieces. The canoes were partly brought down by water. Mr. Stewart and I reached Old Fort Reliance, where the new establishment was also erected about 3 P.M. of the 11th, and the canoes arrived at 10 the next morning.

As there was no prospect of discovering anything more from



this quarter, I conceived that I was not justified in incurring further expense or risk, and, according to your instructions, determined on sending out the people this fall.

Mr. Lockhart had left the day previous to my arrival with two small boats, which, with their ladings, were to have been put "en caché" at Sussex Lake, in the event of the expedition having been continued another season. I sent off two men immediately to recall him. Mr. Stewart remained to pack up everything at the Fort, while I left the 12th, at 2 P.M., to stop the boat coming from Resolution with supplies.

No privation was sustained by the party for want of provisions. We brought three pemmican back. Sir George Back saw immense numbers of deer and musk oxen on his way down. We only saw a few scattered deer with their fawns, the bucks having all passed to the north, and a few herds of musk oxen.

On our way down no time was lost in hunting these, and we got as many Canada geese as we wished by running them down; they were moulting, and were all ganders. On our way up many tracks were seen going south, but no deer until we arrived at MacDougall Lake, and then only a few does. At the head of the river, and in Lake Aylmer and Clinton Colden, they were pretty numerous, and among them many bucks in fine condition. The following is our game list—289 geese, 25 deer, 1 musk ox.

The conduct of the men was beyond all praise. They sustained hardships and risks of no ordinary description, not only with cheerfulness but with gaiety. The weather on the voyage up was very severe. Not a day passed without rain, sleet, and hail, falling between Point Backhouse and Musk Ox Lake, after which we had occasional fine days. None of the party were provided with waterproof clothes or bags; the canoes also were very leaky, still not a murmur was heard, though their groans at night evinced that they suffered from pains in their limbs.

Trusting that my proceedings will be approved of by her Majesty's Government and the Honourable Company,

I have the honour to be,

Your obedient servant,

JAMES ANDERSON, C.F.

21st.—P.S. Messrs. Stewart and Lockhart, with the remainder of the party, arrived here on the 20th instant, and will leave tomorrow morning. They will, I trust, reach Isle à la Crosse, by open water.

J. A.

### III.—On the probable Course pursued by Sir John Franklin's Expedition. By A. G. FINDLAY, F.R.G.S.

*Read, January 28, 1856.*

[The following brief remarks will be confined to the physical geography of the region traversed by the Franklin Expedition, and all that we know of its progress.]

At the meeting of the British Association at Liverpool, I laid before the Geographical section a concise view of the polar currents, showing the remarkable contrast that there is between the physical condition of the north and south polar regions—a subject most worthy the attention of the geographer and geologist.

It was there shown that the warm waters of the equatorial regions passed north-eastward from the Gulf-stream, round the North Cape of Europe, along the northern face of Siberia, and thence on to the Archipelago which lies along the N.E. coast of America, pouring out into Baffin Bay by the various channels from a N.W. direction; another portion, passing north of Greenland and then southward along its eastern coast, round Cape Farewell, and afterwards meeting the Baffin Bay current, forming the Labrador current down to and over the Newfoundland banks to beneath the Gulf-stream. These streams have a remarkably persistent character, as will be more particularly shown hereafter. The certain inference from the recorded facts was shown to be that, whatever is floatable in the so-called Arctic basin, must at some period, or in some form, pass out by Davis Strait, or be drifted on to the shores by this current system, without which the whole of the Arctic regions would be one solid mass of perennial ice, the varying margin of which would protrude over the whole of the northern edges of both continents.

The last despatch from the 'Erebus' and 'Terror,' was from off Melville Bay (the Whalefish Islands, near Disco), July, 1845, and they were last seen near Upernavik, with no ice in sight, and in the middle of Baffin Bay, on July 26th, 1845. The last certain intelligence of the safety of the ships is given in the melancholy notice that John Torrington departed this life "on board of H.M.S. 'Terror,' Jan. 1st, 1846."

The next knowledge that we have is inferential. On August 21st, 1851, or 5½ years later, Dr. Rae, in his exploration of Wollaston Land, picked up in Parker Bay a portion of a boat's mast, marked S. C., with the broad arrow, showing it to be a portion of the mizen-mast of a second cutter in Her Majesty's service; and within half a mile of this was found a piece of oak, apparently part of a boat's awning-stanchion. These most certainly were a portion of the fittings of the unfortunate expedition, which had just come ashore with the flood tide.



### III.—On the probable Course pursued by Sir John Franklin's Expedition. By A. G. FINDLAY, F.R.G.S.

*Read, January 28, 1856.*

[The following brief remarks will be confined to the physical geography of the region traversed by the Franklin Expedition, and all that we know of its progress.]

AT the meeting of the British Association at Liverpool, I laid before the Geographical section a concise view of the polar currents, showing the remarkable contrast that there is between the physical condition of the north and south polar regions—a subject most worthy the attention of the geographer and geologist.

It was there shown that the warm waters of the equatorial regions passed north-eastward from the Gulf-stream, round the North Cape of Europe, along the northern face of Siberia, and thence on to the Archipelago which lies along the N.E. coast of America, pouring out into Baffin Bay by the various channels from a N.W. direction; another portion, passing north of Greenland and then southward along its eastern coast, round Cape Farewell, and afterwards meeting the Baffin Bay current, forming the Labrador current down to and over the Newfoundland banks to beneath the Gulf-stream. These streams have a remarkably persistent character, as will be more particularly shown hereafter. The certain inference from the recorded facts was shown to be that, whatever is floatable in the so-called Arctic basin, must at some period, or in some form, pass out by Davis Strait, or be drifted on to the shores by this current system, without which the whole of the Arctic regions would be one solid mass of perennial ice, the varying margin of which would protrude over the whole of the northern edges of both continents.

The last despatch from the 'Erebus' and 'Terror,' was from off Melville Bay (the Whalefish Islands, near Disco), July, 1845, and they were last seen near Upernavik, with no ice in sight, and in the middle of Baffin Bay, on July 26th, 1845. The last certain intelligence of the safety of the ships is given in the melancholy notice that John Torrington departed this life "on board of H.M.S. 'Terror,' Jan. 1st, 1846."

The next knowledge that we have is inferential. On August 21st, 1851, or 5½ years later, Dr. Rae, in his exploration of Wollaston Land, picked up in Parker Bay a portion of a boat's mast, marked S. C., with the broad arrow, showing it to be a portion of the mizen-mast of a second cutter in Her Majesty's service; and within half a mile of this was found a piece of oak, apparently part of a boat's awning-stanchion. These most certainly were a portion of the fittings of the unfortunate expedition, which had just come ashore with the flood tide.





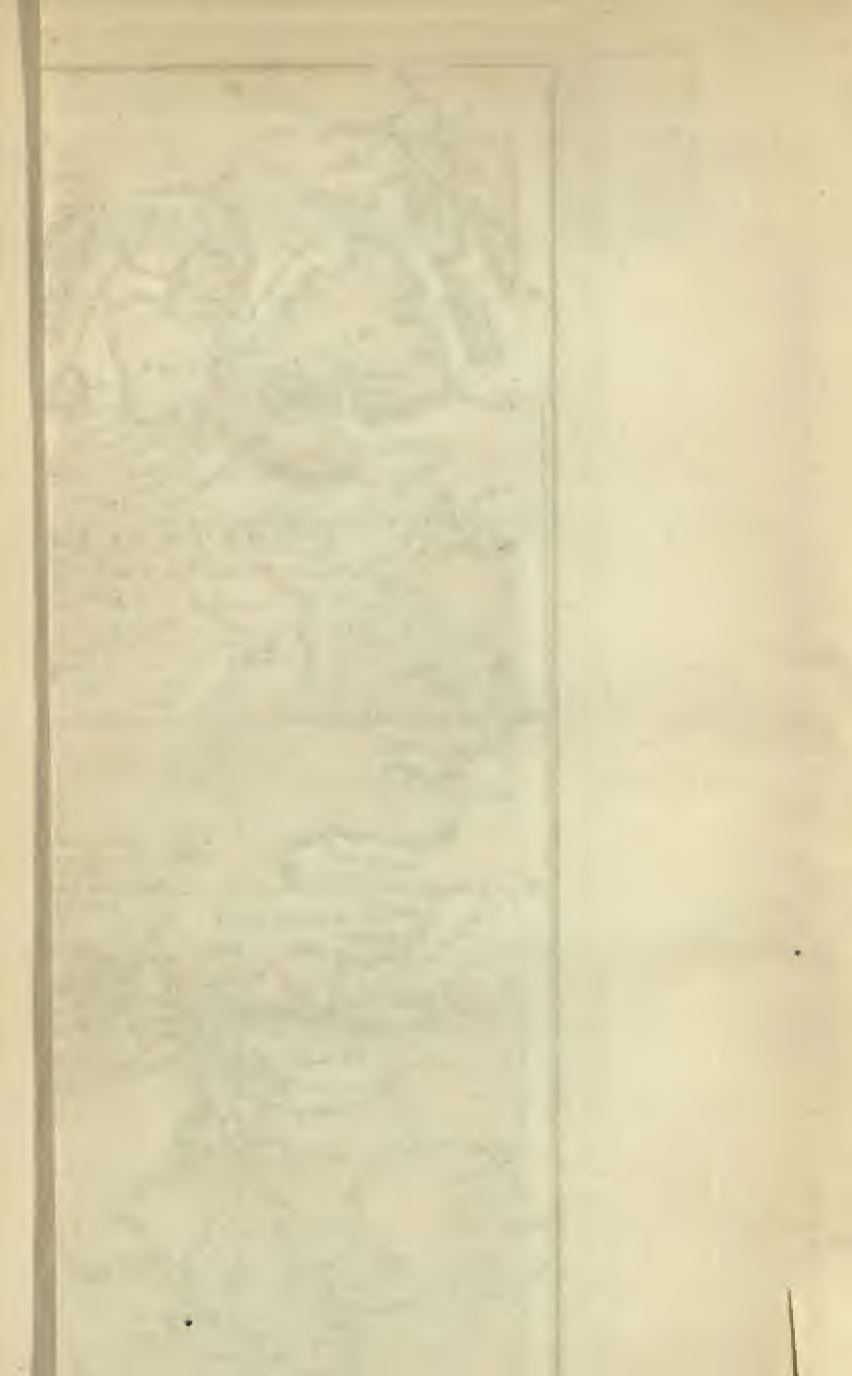
Chart  
Illustrating the remarks of  
M. Findlay,  
on the probable course pursued by  
SIR JOHN FRANKLIN'S EXPEDITION;  
and of  
Capt. Innes,  
on the  
ARCTIC CURRENT AROUND GREENLAND.

Scale of soundings in fathoms shown thus  
1000  
900  
800  
700  
600  
500  
400  
300  
200  
100  
0

Half of Sound, &c. in the sea  
Products of the Franklin Expedition  
Track of Sound and track of commerce

Scale of sea gage miles  
100  
90  
80  
70  
60  
50  
40  
30  
20  
10  
0





In the following year Captain Collinson, when in Cambridge Bay (September 26, 1852), procured from the Esquimaux two metal adzes, fitted in deerhorn handles; one a part of a large metal crutch, with faint traces of the broad arrow, and the other was thought to be part of an iron connecting-rod, belonging to a steam-engine. These articles were afterwards recognised by Dr. Rae as part of an anchor, and some fittings of the boat left on the Coppermine River. There is a difficulty respecting the fragment of a door, or companion hatchway, found by Captain Collinson on the Finlayson Islands, in April, 1853. The latter was not part of a boat's fittings, nor was it recognised as a portion of the 'Terror.' It is possible that it may have come from the ships of the searching squadron, then congregated so numerously about Barrow Strait.

Nevertheless, the position of these articles is remarkable. It is at the head of the tide which comes from the north-east, as absolutely established by Dr. Rae, in August, 1851; the junction of the N.E. and N.W. flood-tides being near the Finlayson Islands. There is no indication whatever of the remains of a *ship* or *ships*. The companion-door, or hatchway, the only relic of a vessel found, would certainly be an evidence against\* the supposition that the ships were wrecked, for had that calamity occurred, very many more remains of a different character, such as spars, planks, &c., would probably have indicated the fact on these well-searched shores.

Supposing my opinion to be correct, it is evident, then, that the 'Erebus' and 'Terror' have not met with any fatal disaster within the influence of the tidal or permanent current which reaches Dease Strait.

The other actual evidences which it is possible may be referred to the Franklin expedition, are those which have been found in May, 1851, up the Wellington Channel, by the parties under Captain Penny. Two of these have been reported on by Dr. Richardson and others. They may be enumerated thus: a piece of English elm, sawn and pitched, found in Record Bay, Baillie Hamilton Island; (it is possible that this weather-worn piece may have come from the encampment on Beechey Island;) a piece of pine, *recently* burnt, found by Mr. Goodsir, with another piece of pine in Disappointment Bay, north of Cornwallis Island. Other wood, found by Captain Penny, thus: an oak stave, 2 ft. long, with five hoop marks, on Point Surprise, Baillie Hamilton Island; one or two pieces of pine, on south shore of Deans Dundas Island; two pieces of pine, on Baring Island; and, in tracking back from Abandon Bay, some small pieces of driftwood.

\* An opposite conclusion may be formed, since a further search may lead to other fragments.—G. B.



Mr. Goodsir found at the same time (May, 1851) a piece of American pine, 12 ft. long, and some very small pieces of pine, on the coast from Cape Austin westward. These might have been more abundant, but the track lay from point to point, and not round the bays, where they might have existed.

Now, it may be remarked that these were all found at that part of the Wellington Channel, where the influences of the drift from Barrow Strait and from the Polar Sea would meet (or as they did in September to November, 1850), as will be shown presently, and that they did not necessarily come from the northward. This last supposition added very greatly to the interest of the subsequent search up the Wellington Channel. They may also have come from Beechey Island in 1845-6, though the character of some of them will scarcely allow such a supposition.

To connect these distant evidences with the sad discovery of Dr. Rae,\* at the mouth of the Back River in April and May, 1854, will require some speculation; but this, too, is much narrowed, if faith may be placed in two reports, which at the time were held to be true by some and denied by others. Our present knowledge will give great weight to these two reports, discarding the statement of Adam Beck.

The first of these is the report brought to England by Mr. Parker, of the 'Truelove,' a voluntary statement made by an Esquimaux at Pond Bay, in July, 1849.† He stated that two ships had been frozen up for three or four years on one side of Prince Regent Inlet, and two ships frozen up for one year on the other, and that he, the Esquimaux, had been on board all four ships in the previous April or May, 1849. Several discrepancies in the published statement have evidently arisen from ignorance of the Esquimaux language; but it was *firmly believed* and *acted on* by the masters of the whalers, who heard it.

The two lower ships in the Esquimaux' diagram, or those to the eastward, were evidently intended for those of Sir James Ross—the 'Enterprise' and 'Investigator'—at that time lying in Port Leopold, and are not those which had been longest there, as was supposed to be said. The other two ships must, therefore, be looked for to the westward, and were shown with their topmasts struck, and not in any enclosed harbour or space, as were Sir James Ross's vessels. The pathway between was misunderstood to be a communication between the four ships in proximity, but must refer to the Esquimaux' route.

In reconciling this statement with the explorations made, it may be positively assumed that the 'Erebus' and 'Terror' were not

\* See Dr. Rae's Report, J. R. G. S., vol. xxv. pp. 246-256.—G. B.

† This statement was confirmed by a diagram which the Esquimaux drew of the position of the ships.

detained on the shores of Peel Sound (or *Inlet*), which have been explored by Sir James Ross, Lieut. Browne, Mr. Kennedy, and Lieut. Bellot; \* nor on the north coast of Prince of Wales Land, which was scrupulously examined by the officers of Captain Austin's squadron; nor on its west or south-west coasts, which were travelled over by Captain Ommaney and Lieut. Sherard Osborn. The character of the ice met with by Lieut. Osborn would be a strong argument against the possibility of ships proceeding S.E. out of Melville Sound. Besides this we have the negative evidence of their non-existence, in the absence of all late Esquimaux reports.

It is then somewhere in Melville Sound that we may presume Franklin's four dreary years were passed. This enclosed sea is filled with *old* ice, piled up into hummocks, constantly receiving accessions from Banks Strait, and at intervals leaving it by Barrow Strait, which process of emptying does not appear to have taken place in 1848 or 1849, as neither Mr. Parker nor Sir James Ross were able to get through in those years, or beyond Croker's Bay in one case, or Cape Rennell in the other. In April, 1851, Captain Austin's officers found that between Griffith Island and Cape Walker it was *new* ice, but about Lowther Island and to the north of it, it was the *old* floe.

Having thus contracted the field of surmise, we may almost certainly believe that Sir John Franklin, after leaving Beechey Island in the open season of 1846, following his instructions, pushed forward for the "space between Melville Island and the north coast of America;" and having proceeded up Melville Sound, became imbedded in the pack, as Captain Kellett did in 1854, and perhaps about the same spot. The seasons after were probably severe; we know that 1848 and 1849 were, and thus the eastward drift was slow, but may not have entirely ceased. Thus

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\* Peel Sound has evidently no direct connexion with Victoria Strait. Sir James Ross, whose chart of 1849 has since been followed, was not assured of the continuity of the coast on its east side, which he laid down south of lat. 72° 44', the farthest point attained; and his Cape Bird is a bill. Mr. Kennedy believed, and Lieut. Bellot says positively, that the land is continuous to the S.W. of the so-called Bellot Strait, and that the islands, marked by Sir James Ross, are hills on a plain. They are the Union Mountains of Sir John Ross in 1829. Lieut. Browne (in May, 1851) believed that Peel Sound was frozen solid to the bottom; there were no tide-marks, the ice was smooth, and it was manifestly seldom, if ever, open to navigation. The 'Erebus' and 'Terror' therefore could not have passed by Peel Sound into Victoria Strait.

Victoria Strait must run N.W. from Gateshead Island (or towards Banks Strait), in the same direction as the greater part of these shores. There is some evidence of this in the vast pressure of ice from the N.W. against the southern coast of Prince of Wales Land, described by Lieut. Sherard Osborn, which would indicate a S.E. current, as well as the effects of wind. The distance between the termination south-westward of Lieut. S. Osborn's journey, May 23, 1851, and that of Lieut. Wynniatt from the west, May 26, 1851, must be at least 118 or 120 miles, instead of 80 miles, as is shown on recent charts.



the 'Erebus' and 'Terror' slowly drifted back toward Barrow Strait, and approached Prince of Wales Land, where they were visited by the Esquimaux, at the time that Sir James Ross was in Port Leopold; and in 1850, when the season opened, the ships, having to pass through the contracted channels formed by the islands north of Cape Walker, became nipped and raised on to the hummocky ice, by which process they were rendered unseaworthy. They may have been now dismantled, and the crews taking their boat and sledges may have passed down Peel Sound; or they may have travelled along the western shore of Prince of Wales Land, and thus reached the north shore of King William Land, at the latter end of the summer of 1850, in a state of destitution.

As to the course pursued after the opening of the ice in 1846; it may have been late, perhaps September, this year, but there is no evidence of more than one season being spent at Beechey Island. It is thought by several, whose opinions are entitled to every respect, that they went up Wellington Channel. There is no evidence to contradict this. But when the Grinnell expedition entered this channel in 1850, Dr. Kane considered that the ice which filled it was at least *two* years old. Giving due weight to this supposition, there is no reason for thinking that it had been traversed at least later than 1847 or 1848. But in any case it must be considered that the ships ultimately found their way into Melville Sound, it might be by Byam Martin Channel. Had they have passed a winter near the shores of Penny's Strait, it would be reasonable to expect that some indications would have been met with by Commander Richards or Lieut. Sherard Osborn in their explorations of the north shore of the Parry Islands in April to July, 1853. It is possible that they may even have found their way farther to the northward than these journeys extended; but in any case it may be asserted that they ultimately reached Melville Sound, for had they have left their ships to the northward, the traces of the retreating party towards the Back River must have been crossed by some of the numerous travelling parties on either side of the Parry Islands.

Against all this reasoning we have the evidence of the Pond Bay Esquimaux, be it of what value it may, that two ships had been frozen up for *four* winters. It is strenuously asserted that the final separation from the ships occurred in Melville Sound, and may have been caused by damage to the vessels at the end of 1849 or commencement of 1850; or, if that catastrophe occurred previous to that date, they may, from the nature of the ice, have been beyond the reach of the land, till the ever-continuing eastward drift of the ice brought them within reach of its eastern shores. It may be urged against the inference that these three or four winters were passed in inactivity in Melville

Sound, that their crews would have made some attempt to communicate with the Hudson Bay posts. But to this it may be said, that the crews would naturally keep to their ships as long as there was hope of their extrication, or to the limit of their endurance, the latter of which was reached, and the former past.

It may be proper to allude to the reports sent home from Kotzebue Sound in 1851-2, from the natives to the east of Point Barrow.\* There are several of these relating to white men and a three-masted ship having been seen on the coast in 1849; but these testimonies are so vague, and may have arisen from affirmative answers being given to leading questions—a very common practice—that much weight cannot be given to them, if they are at all worthy of consideration.

The information obtained by Dr. Rae was that the party were travelling southwards, with a boat and sledges, in the spring of 1850.† The distance from where it may be presumed they were first seen to Cape Walker is 270 miles. Having a boat to drag, their progress would be slow, perhaps not more than 4 or 5 m. per day made good. This would bring the commencement of their journey from Barrow Strait up to January or February, 1850, supposing them to have travelled in mid-winter; otherwise their journey would reach up to the autumn of 1849.

It is very improbable that the ships still remain in Victoria Strait or Peel Sound, the only portion of the Arctic Archipelago which has not been strictly examined. The Esquimaux were informed by the retreating party that their ships were *crushed* by the ice, and should they have been destroyed in Peel Sound, some of the wreck (besides a hatchway door) would have reached Wollaston Land. If they had remained *fixed* in that part—a case beyond supposition—the fact would have been known to the Esquimaux, and their locality been told to Dr. Rae in 1854. It may be positively stated that they came from the north-west, and not from the *east* side of Peel Sound. One circumstance, to which attention is particularly directed, will prove this. The depôt of provisions left on Fury Beach in 1825 and 1833, on the west side of Prince Regent Inlet, which was well known to exist by Sir John Franklin's party, was found still there by Mr. Kennedy and Lieut. Bellot in March, 1852.‡ The fugitives were making the best of their way toward the Hudson's Bay settlements, and could not afford time for the chances of finding this depôt in the same state that it was left. Another circumstance also bears on this point. If the boats or ships had entered Prince Regent Inlet (a part much to be avoided) and met with

\* See Parliamentary Papers, 1852.

† See 'Naut. Mag.,' Nov. 1854, p. 613.

‡ See 'Journal of Royal Geographical Society,' vol. xxiii., 1853, pp. 126 and 129.



any disaster, some of the remains would have reached Pelly or Committee Bays, which were searched by Dr. Rae, as both Parry in 1825, and Bellot in 1852, remark on the generally *southern* set of the ice, which prevails for seven out of ten days.

It is possible that Melville Sound may contain some hitherto unknown land, which was the scene of the wintering between 1846 and 1850. It may be filled with ice of such an impracticable nature, from its heaped up and broken state, that travelling over it may have been impossible.

Should this process of reasoning be held valid, it may be expected that no record of their track exists along Victoria Strait but those found by Dr. Rae and Captain Collinson to the southwest. The Hudson Bay Company's Expedition, sent by direction of Government, under Messrs. Anderson and Stewart, have therefore failed in gaining any knowledge of the fate of the ships beyond the confirmation of the boat party on Montreal Island. The dismantling of the ships in Barrow Strait may have been the origin of those pieces of driftwood up the Wellington Channel.

Of the ships themselves, not the slightest vestige has been found in the Arctic searches, nor a single article which may be referred to their destruction. We may then more safely believe that they were the two ships seen on an ice-floe, *not an ice-berg*, as generally but erroneously stated, on the Northern edge of the Newfoundland Bank, by the 'Renovation' on April 20, 1851. The credibility of the report and the possibility of the occurrence have each been contested.

*First*—as to the credibility of the report: the most rigid and searching inquiry failed to shake the testimony of numerous witnesses dispersed over various parts of the world, and who could have no possible object in combining to deceive. Minor discrepancies may have arisen, but the general evidence is untouched. Captain Ommaney, R. N., who took an active part in the inquiry, says, "that two vessels were seen in the position described, there seems to be not a shadow of doubt." And if so, the exact accordance in the appearance of the reported ships, and almost impossibility of there being any other similar ships—leads me to the irresistible conclusion that they were the 'Erebus' and 'Terror.'

*Secondly*—as to the possibility of the occurrence. We may find many recorded facts which will demonstrate the perfect consistency of such an appearance with physical phenomena. As the examples I would wish to mention will throw considerable light on the current systems around Greenland, as well as on the sustaining powers of ships in such situations, I will enumerate them, in addition to the information afforded by the diagram. Proceeding chronologically:—

The Dutch or Danish Greenland fleet, wrecked in 1777, in lat.  $78^{\circ}$  or  $80^{\circ}$  and long.  $5^{\circ}$  or  $6^{\circ}$  E; the last survivor drifted to lat.  $62^{\circ}$ , long.  $40^{\circ}$  W., about 1300 m. in 108 days, or 12 m. per day.\*

The 'Henrietta' of Whitby, beset in  $80^{\circ}$  N.,  $6^{\circ}$  E., drifted first W., then S., to lat.  $73\frac{1}{2}^{\circ}$ , long.  $9^{\circ}$ ;  $8\frac{1}{2}$  m. per day.†

On May 5, 1817, four vessels were wrecked in  $78^{\circ}$  N. and  $3^{\circ}$  W., and found floating May 18, in  $75^{\circ} 28'$  N. and  $10^{\circ}$  W., or 182 miles in 13 days, or 14 m. per day. At the end of May they were seen in lat.  $73\frac{1}{2}^{\circ}$ .‡

Captain Scoresby himself was drifted from July 1, 1817, lat.  $75\frac{1}{2}^{\circ}$  and long. 8 W., 110 or 120 m. to S., at 12 or 13 m. per day.§

Admiral Taylor relates the circumstance of a whaler, who was wrecked off Spitzbergen; the men taking to their boats, one of which became fixed in the ice, and drifted around Cape Farewell up to about  $65^{\circ}$  N., where the last survivors were rescued.¶

Captain Back in H.M.S. 'Terror,' (the fate of which we are now inquiring into,) was drifted in the ice to the S.E., from September 20, 1836, to July 1837. She was imbedded for 118 days, and although crushed and in continual peril from the proximity of the land, her commander was enabled to bring her home.

Captain Bird in H.M.S. 'Investigator,' threw overboard a cask in lat.  $73^{\circ} 50'$ , long.  $78^{\circ} 6\frac{1}{4}'$ , on August 28, 1848. It was picked up off Cape Hooper, October 1, 1848, lat.  $68^{\circ} 10'$ , long.  $64^{\circ} 30'$ , having drifted 440 miles in 33 days, or 13.3 m. per day.¶

Sir James Ross's Expedition was drifted from a point north of Leopold Island on September 1st, 1849, to Cape Graham Moore on September 24, a distance of 260 m., or 11 m. per day.

The drift of the first Grinnell Expedition, under De Haven and Kane, is the most parallel case to that now supposed to have occurred to the 'Erebus' and 'Terror,' inasmuch as it occurred about the same year.

The 'Advance' and 'Rescue' became beset on their return from Griffith Island in the entrance of the Wellington Channel, September 14, 1850. They then drifted up that channel to the north, making the discovery of Grinnell Land, and scarcely at any time going southward till October 1st, when the spring tides counteracted the northward tendency, and the two beset ships passed southward again, reaching Cape Hotham on October 8. This drift is more particularly noticed to account for the drift-wood from the south about Baillie Hamilton Island. It may perhaps be also an index of the time when that drift occurred.

\* Dr. Scoresby, pp. 216-7; see also *note* †, at p. 36 of this.

† *Ibid.*

‡ Dr. Scoresby, pp. 216-7.

§ *Ibid.*

¶ Parliamentary Papers, 1851, vol. xxxiii.

¶ 'Naut. Mag.,' Dec. 1848.



The Grinnell ships remained moving about Beechey Island till November 17th, drifting slowly till December 1, when they passed eastward out of Lancaster Sound, and were not released till June 5, 1851, in lat.  $66^{\circ} 33'$ , long.  $59^{\circ} 6'$ , off Cape Walsingham, a distance of about 780 m., at an average rate of 4.2 m. per day. The total linear drift was 1050 m., and they were imbedded and uninjured in the same floe for 15 months.

A later, and, except as to time, a more similar case, is that of Captain Kellett's ship, the 'Resolute,' which drifted from Melville Sound between May 15, 1854 to Cape Enderby in the middle of October, 1855, a distance of 960 m. in 17 months, and apparently found uninjured.

There is thus no difficulty in comprehending that the Franklin ships may have drifted from Melville Sound as far as, or beyond Cape Walsingham, imbedded in the same floe. A perusal of the admirable work of Dr. Kane will throw great light on this possibility.

To carry the ice drift still farther southwards, we may find very numerous examples and arguments in the abundance of the ice, that is periodically met with drifting down to and into the gulf stream. The zeal of Mr. Redfield has collected a very large number of instances \*—

One or two examples which I have found will be sufficient, as they refer to the time in question.

The 'Carlo Mauran,' commanded by Mr. Tillinghore, passed on May 23, 24, 25, 1851, between lats.  $44^{\circ}$  and  $45^{\circ}$ , and longs.  $49^{\circ}$ – $54^{\circ}$  large quantities of ice.†

On June 27, 1851, the Washington Steamer, from New York to Southampton, passed 10 very large ice-bergs between longs.  $50^{\circ}$ – $45^{\circ}$  in lat.  $47^{\circ}$ .‡

It is probable that the southward current runs more strongly to the southward of Cape Walsingham, as it will be joined by the branch which sets northward along the Danish settlements of Greenland, and with still greater velocity below the parallel of Cape Farewell, as the current which passes between East Greenland and Iceland will afterwards unite with the Davis Strait current, and thus united bear down towards the Labrador coast. This westward tendency of the currents in these latitudes must be owing to the effect of the rotation of the earth; the velocity of which very rapidly increases southwards in these parallels.

In tracing what may have been the drift of the ice-floe with the two ships from the northward, our data thus vary very considerably; but from what has been said it may be presumed

\* See Purdy's Atlantic Memoir, 1853, pp. 490–493.

† 'Shipping Gazette,' June 18, 1851.

‡ Ibid., July 4, 1851.

that with a drift of 12 m. per day, they would have been off Cape Walsingham (1200 m. distant) about January 20, 1851: 12 m. = 100 days—April 20 = January 20; or if 18 m. per day about February 3: 18 m. 66 6 days—April 20 = February 3.

From hence to Lancaster Sound occupied 6 months by the Grinnell Expedition: 6 months—January 20, 1851 = June 29, 1850; or as by the cask from the 'Resolute' 44 days: 6 months—February 3, 1850 = July 3, 1850; a very wide difference. At the slowest rate they would have been off Lancaster Sound about July 3 or June 20, 1850: 44 days—January 20, 1851 = December 6, 1851; at the quickest, December 6th or 19th, 1850: 44 days—February 3 = December 19, 1851. From thence to Wellington Channel, at the rate of Sir James Ross's drift, they would have been there in May or June or November or December, 1850, at the quickest or slowest of the foregoing rates of travelling.

At the same rate of drift as the 'Resolute,' May 1854 to October 1855: 18 months + 85 days—April 20, 1851 = July 25, 1849; they might have left the longitude of  $101^{\circ}$  or  $102^{\circ}$  W. in August or September, 1849: 18 months + 60 days August 15, 1849.

We have thus a series of precedents, by which it may be estimated that they may have been off Peel Sound between August 1849 and May 1850.

The first of these periods, August 28, 1849, is precisely that when Sir James Ross left Leopold Harbour, and included the period when the Esquimaux of Pond Bay said that he had visited them.

The Arctic squadron under the orders of Austin, Ommaney, Penny, Sir James Ross, and De Haven, got into Lancaster Sound in August 1850, and were all, except the Grinnell Expedition, congregated about Griffith Island, as before stated, by September 10 or 12—their cruising then had been chiefly on the north side of the Channel.

It is therefore manifest that the 'Erebus' and 'Terror' *may* have passed unobserved down Barrow Strait *after* Sir James Ross's departure, and *before* the arrival of the Austin squadron. Upon this reasoning therefore, the object of this paper is to demonstrate the *possibility*, and if so, the almost *positive certainty*, that the ships seen April 20, 1851 on the Newfoundland Banks, were the 'Erebus' and 'Terror'; that their presumed course will perfectly coincide with Sir John Franklin's instructions and with the discoveries of Dr. Rae and others; and that the points, here urged, may be accepted among the vast amount of speculation which has arisen, as an approximation to the reality.



IV.—*The Arctic Current around Greenland.* By Captain E. IRMINGER of the Danish Navy, Corresponding Member R.G.S.

Communicated by DR. SHAW.

*Read, April 28, 1856.*

SEVERAL hydrographers\* assert that a current from the ocean around Spitzbergen continues its course along the E. coast of Greenland, and thence in a nearly straight line towards the banks of Newfoundland. In this opinion I do not agree, and give my reasons as follows.

Considerable quantities of ice are annually brought with the current from the ocean around Spitzbergen to the S. and S.W. along the E. coast of Greenland,† around Cape Farewell, and into Davis Strait.

These enormous masses of ice are frequently drifted so close to the southern part of the coast of Greenland that navigation through it is impossible. Experience has taught the captains who every year navigate between Copenhagen and the Greenland colonies (which all are situated on the W. side of Greenland) that, on going to these colonies, in order to avoid being beset in the ice, they are obliged to pass a couple of degrees to the southward of Cape Farewell, as well as, after having crossed the meridian of this cape, generally not to steer much to the northward before reaching long.  $50^{\circ}$  or  $52^{\circ}$  W. of Greenwich, and sometimes even more westerly. The amount of westing is dependent on the wind, weather, or ice; and by proceeding thus an open sea is reached, either quite free from ice or else with it much more diffused than near the coast, where the ships would be liable to be caught in the drifting masses.

\* Kerhallet, Berghaus, and others.

† See Graah, Scoresby, &c., as well as the 'Accounts of the Whalers in the year 1777, by Lorenz Hansen, Director of the School at Ribe,' in Denmark. These last-mentioned accounts of ten whalers, with their captains, and printed letters from several of these captains to the above-mentioned L. Hansen, give a striking proof of the current and its rapidity from the ocean around Spitzbergen to the S.W. along the E. coast of Greenland. The said ten vessels were enclosed in the ice in June, 1777, in about  $76^{\circ}$  lat. N., between Spitzbergen and Jan-Mayen island, and were carried, constantly enclosed by the ice, in a south-westerly direction, between Iceland and Greenland, very often in sight of the Greenland coast. By degrees all the vessels were lost, being crushed by the ice; the last vessel on the 11th of October, in  $61^{\circ}$  lat. N., in sight of Greenland. Of the crews of these vessels, which consisted of about 450 men, only 116 (whose names I have before me) were so fortunate as to save their lives, and get ashore from the ice in the month of October and beginning of November, on the coast around Cape Farewell. By calculating the distance between Cape Farewell and the place where the vessels were enclosed in the ice between Spitzbergen and Jan-Mayen, it gives a distance of about 1400 nautic miles, and the time the ice occupied in drifting from the above-mentioned place to Cape Farewell being about four months, the rapidity of this current has a mean of at least between 11 and 12 nautic miles per 24 hours.

A similar caution is exercised on the homeward passage from the colonies, the course being in the first place off the land, and then in a more southerly direction in order to reach the open sea free from the dangerous ice.

To be enabled to give an idea about the limits of the ice in these regions, I examined a set of logbooks which were kindly given me for perusal from the directors for the "Royal Greenland Commerce," viz., two logbooks for each of the last five years, which gives two outward and two homeward voyages to the colonies every year, consequently in all twenty voyages, which I found sufficient without extending these researches to too great a length.

There are unquestionably great changes in the limits of the ice in different seasons; but still it is probable that the result of these five years' observations will not be far from the mean.

From these logbooks I noted at what latitude the meridian of Cape Farewell had been crossed on the passage to the colonies, and at what place the first ice was seen, and on what latitude the meridian of Cape Farewell was crossed on the homeward passage, and where the last ice was seen.

In the ensuing Table these positions are inserted, and to make the subject still clearer, the places where the first and the last ice was seen are marked in the subjoined Plan.

By examining this Table it will be seen that the meridian of Cape Farewell is crossed on the outward passage in a mean lat. of  $57^{\circ} 46'$ , and on the homeward passage in  $58^{\circ} 2' \text{ N.}$ , which gives 123 m. and 107 m. S. of Cape Farewell\* respectively as the points where the ocean, according to the logbooks, *has been quite clear of ice*, and where, under ordinary circumstances, a safe passage can be made to avoid the ice, which is usually carried round the coast of Cape Farewell by the current coming from the ocean around Spitzbergen.

On the voyages from the colonies to Copenhagen the course pursued has been somewhat nearer Cape Farewell (16 m.), the cause of which is—1, that the captains, in coming from Davis Strait, have a better knowledge of the situation of the ice, and its distance from the land, than they can have on going up to Greenland in coming from the Atlantic Ocean, where no ice is to be seen; and 2, because the home passages are made in a season in which the ice generally is not quite so abundant as in spring, the season for the voyages to the colonies.

The subjoined Table shows that the brig 'Lucinde' fell in with ice farthest to the E. (4th October, 1851, in  $58^{\circ} 30' \text{ N.}$ , and  $39^{\circ} 30' \text{ W.}$  of Greenwich), which gives 79 nautic m. S., and about

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\* According to the observations of Captain Graah, Cape Farewell is situated in  $59^{\circ} 49' \text{ lat. N.}$ , and  $43^{\circ} 54' \text{ W.}$  of Greenwich.



Years.	Vessel.	Commander.	Outward Voyage to Greenland.				Homeward Voyage from Greenland.				
			Meridian of Cape Farewell passed.	Date.	First ice seen.		Meridian of Cape Farewell passed.	Date.	Last ice seen.		
					Lat. N.	Long. W.			Lat. N.	Long. W.	
1849	Brigantine Neptune .	Kaaden .	58° 0' N.	July 26	58 10	47 19	58 5' N.	Aug. 31	58 24	44 35	Aug. 31
—	Barque Jallanehah .	Euhn .	59 23 „	May 10	{ Much ice at 25 m. } { S. of C. Farewell }		57 45 „	Aug. 31	59 50	46 30	Aug. 29
1850	Brig Hvaldiken .	E. Humble .	58 8 „	June 6	59 50	50 0	58 16 „	Sept. 23	60 0	47 20	Sept. 21
—	Brig Egdesminde .	Moberg .	57 10 „	May 28	60 30	52 10	57 50 „	Sept. 28	61 34	53 53	Sept. 23
1851	Brig Lasclo . . .	Faltings .	58 8 „	April 26	58 26	50 9	58 35 „	Oct. 2	59 30	39 30	Oct. 4
—	Brig Mariane . . .	Dreyer .	57 30 „	July 1	57 55	47 52	58 9 „	Sept. 12	59 44	46 46	Sept. 11
1852	Brig Isalder . . .	P. Ocken .	57 43 „	April 7	60 5	52 30	58 9 „	June 9	60 15	37 14	May 27
—	Ditto, 2nd voyage .	P. Ocken .	55 55 „	Aug. 10	{ Anchored at Godhavn, Aug. 19, without seeing any ice on the voyage . . . . . }		56 36 „	Oct. 13	60 45	53 5	Oct. 8
1853	Brig Isalder . . .	P. Ocken .	57 56 „	May 1	63 50	56 0	57 54 „	June 10	64 7	54 18	June 5
—	Brig Pera . . . .	Humble .	57 45 „	June 23	59 44	52 35	58 58 „	Sept. 17	60 40	46 45	Sept. 16

135 nautic m. E. of Cape Farewell. This ice consisted only of a single isolated floe of very small extent; and it is very rare to meet ice in this latitude so far to the eastward.\*

On the passage from Julianehaab to this place very little ice had been in sight.

On these voyages the first and the last seen ice generally consisted of *isolated icebergs or floes*, which, no doubt, formed the *very extremity of the ice* which was coming from the N.E. around Cape Farewell, and going into Davis Strait. Consequently the great and more accumulated masses of ice carried by the current from the ocean around Spitzbergen (whereby this current is really indicated) are *between these above-named outer limits and the coast of Greenland*.

The southerly and south-westerly coasts of Greenland are most exposed to be blocked up with these ice-drifts *in spring*; whilst, on the contrary, they are pretty clear of ice from September to January; but in the end of this month the ice generally begins to come again in great abundance, passing around Cape Farewell. (*Captain Graah*, p. 59.)

Still farther to demonstrate the existence of this ice-drift, I may mention the following extract from the logbook of the schooner 'Activ,' Captain J. Andersen. This vessel belongs to the colony of Julianehaab, and is used as a transport in this district:—

7th of April, 1851, the 'Activ' left Julianehaab, bound to the different establishments on the coast between Julianehaab and Cape Farewell. The same day the captain was forced by the ice to take refuge in a harbour. Frequent snow-storms and frost. On account of icebergs and great masses of floe ice enclosing the coast, it was impossible to proceed on the voyage before the 23rd, when the ice was found to be more open; but after a few hours' sailing the ice again obliged the captain to put into a harbour. Closed in by the ice until the 27th. The ice was now open, and the voyage proceeded until the 1st of May, when the ice compelled him to go into a harbour.

In this month violent storms, snow and frost. From the most elevated points ashore very often no extent of sea visible; now and then the ice open, but not sufficiently so for proceeding on the voyage.

At last, on the 6th of June, in the morning, the voyage was continued; but the same evening the ice enclosed the coast, and

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\* On the voyage to Greenland in 1828, Captain Graah fell in with the first ice in  $58^{\circ} 52'$  lat. N., and  $41^{\circ} 25'$  W. Greenwich, which is only 57' S., and about 77 nautic miles to the eastward of Cape Farewell; and he says, "Since 1817, I do not know that the ice has been seen so far to the eastward of the Cape."—*'Narrative of an Expedition to the East Coast of Greenland, by Capt. W. A. Graah, Royal Danish Navy,'* p. 21, Engl. Transl.



the schooner was brought into "Blieschullet," a port in the neighbourhood of Cape Farewell.

The following day the voyage was pursued through the openings between the ice; and the 18th of June the schooner arrived again at Julianehaab.

Whilst the masses of ice, as above mentioned, enclosed the coast between Julianehaab and Cape Farewell, the brig 'Lucinde' crossed the meridian of Cape Farewell on the 26th of April, in lat.  $58^{\circ} 3' \text{ N.}$  (101 nautic m. from shore), and no ice was seen from the brig before the 2nd of May, in lat.  $58^{\circ} 26' \text{ N.}$ , and  $50^{\circ} 9' \text{ W.}$  of Greenwich.

Further, Captain Knudsen, commanding the 'Neptune,' bound from Copenhagen to Julianehaab, was obliged, on account of falling in with much ice, to put into the harbour of Frederikshaab on the 8th of May, 1852, and was not able to continue his voyage to Julianehaab before the middle of June, because a continuous ice-drift (icebergs as well as very extensive fields) was rapidly carried along the coast to the *northward*.

Captain Knudsen mentions, that during the whole time he was closed in at Frederikshaab he did not a single day discover any clear water even from the elevated points ashore, from which he could see about 28 nautic m. seaward.

Whilst the 'Neptune' was enclosed by the ice at Frederikshaab the brig 'Baldur,' on the home passage from Greenland to Copenhagen (see the foregoing Table), crossed the meridian of Cape Farewell the 9th of June in lat.  $58^{\circ} 9' \text{ N.}$  (100 m. from shore) in clear water, and no ice in sight.

From the above it is evident that the current from the ocean around Spitzbergen, running along the E. coast of Greenland past Cape Farewell, continues its course along the western coast of Greenland to the N., and transports in this manner the masses of ice from the ocean around Spitzbergen into Davis Strait.

If the current existed, which the beforenamed writers state to run in a direct line from East Greenland to the banks of Newfoundland, then the ice would likewise be carried with that current from East Greenland; if it were a submarine current, the deeply-immersed icebergs would be transported by it; if it were only a surface-current, the immense extent of field-ice would indicate its course,\* and vessels would consequently cross these ice-drifts at

\* An observation which it is interesting to mention here, and which gives a proof of the very little difference between the temperature of the surface and that at some depth, is mentioned in the Voyage of Captain Graah, p. 21. He says, "The 5th of May, 1828, in lat.  $57^{\circ} 35' \text{ N.}$ , and  $25^{\circ} 36' \text{ W.}$ , Gr., the temperature of the surface was  $50.3$  ( $46.2$  Fahr.), and at a depth of 600 feet  $50.5 + R.$  ( $44.5$  Fahr.)." This proves that there is no cold submarine current in the place alluded to to the S.W. of Cape Farewell. A still more conclusive experiment is recorded by Sir Edward Parry in the account of his first voyage, June 13, 1819: in lat.  $57^{\circ} 51'$

whatever distance they passed to the southward of Cape Farewell. *But this is not the case*: experience has taught that vessels coming from the eastward, steering their course about  $2^{\circ}$  (120 nautic m.) to the southward of Cape Farewell, seldom or ever fall in with ice before they have rounded Cape Farewell and got into Davis Strait, *which is a certain proof that there does not exist even a branch of the Arctic current which runs directly from East Greenland towards the banks of Newfoundland.*

Along the E. coast, and around the southern and south-western coast of Greenland, the district of Julianehaab, there is generally a much greater accumulation of ice\* than is the case more northerly, on the W. coast, or farther out in Davis Strait, where the ice generally is found more spread, and consequently it frequently happens that vessels bound to Julianehaab from Copenhagen are obliged first to put into some harbour more to the northward, and wait there until the ice is so much dispersed round the S. coast that they can continue their voyage to Julianehaab.

In the warmer season, when the ice and snow melt ashore, the waters from the different fiords or inlets move towards the sea and drive the ice off the coast in such a manner that there is clear water close in shore, through which vessels may be navigated. However, continuing gales, according to their direction to or from shore, have an influence on the situation of the ice.

Another proof that the current from East Greenland does not run in a straight line towards the banks of Newfoundland, is also derived from the observations of the temperature of the surface made on many voyages to and from Greenland. I have noted the observations of two voyages in the subjoined map; one voyage by Captain Graah to Greenland, in May, 1828; and the other by Captain Holbøll, from Greenland to Copenhagen, in September, 1844.

Capt. Graah, who during his researches in Greenland passed two summers and one winter on its eastern coast, between Cape Farewell and  $65\frac{1}{2}^{\circ}$  lat. N., says that he never found the temperature of the sea here higher than  $0^{\circ}9 + R.$  ( $34^{\circ}$  Fahr.) †

Supposing that the Arctic current from East Greenland pursued its course in a straight line towards the banks of Newfoundland, it would be crossed, on the voyages from Copenhagen to the Danish colonies in Greenland, between  $38^{\circ}$  and  $45^{\circ}$  W. Gr., and so high a temperature in the surface of the ocean as from  $4^{\circ}$  to  $6^{\circ} R.$  ( $41^{\circ}$  to  $45^{\circ}5$  Fahr.), as is found on this route and marked

N., long.  $41^{\circ}5'$ , with a very slight southerly current, the surface temperature was  $40\frac{1}{2}^{\circ}$  Fahr.; and at 235 fathoms  $39^{\circ}$ , a difference of only  $1\frac{1}{2}^{\circ}$ .—Ed.

\* Captain Graah, pp. 10, 12, 22, 57, &c. English translation.

† Graah says, "The temperature of the sea was frequently observed during the whole voyage, and was always found between  $28^{\circ}$  and  $34^{\circ}$  Fahrenheit."



in the plan, would, according to my opinion, be impossible only  $1^{\circ}$  or  $2^{\circ}$  to the southward of the parallel of Cape Farewell; as it is a well known fact that the principal ocean-currents maintain their temperatures through very considerable distances of their courses.

This comparatively high temperature of the surface of the ocean so near to the limits of that current which carries enormous masses of ice from the ocean near Spitzbergen round Cape Farewell, warrants my opinion that the waters of the Atlantic Ocean move in a N.-westerly, or northerly direction, towards the eastern and southern coasts of Greenland,\* and that this in-draught towards the land is undoubtedly the cause of the ice being so closely pressed on to these parts of the coast as it is so frequently on the S. coast, and almost constantly on the E. coast, rendering the eastern coast entirely inaccessible from seaward.†

The log-books which I have examined afford no positive information as to the direction and force of the current under consideration—a circumstance which must be attributed to the frequency of fogs and gales of wind, which prevent correct observations being made.‡

From the foregoing it seems to me to be demonstrated that the current from the ocean around Spitzbergen, which carries so considerable masses of ice, after it has passed along the E. coast of Greenland, turns westward and northward round Cape Farewell, *without detaching any branch to the south-westward, directly towards the banks of Newfoundland.*

\* Graham says in his Narrative (p. 23, English translation),—"In the month of Davis Strait I found the temperature of the surface of the ocean from  $4^{\circ}$  to  $3^{\circ}\cdot1$  R. ( $41^{\circ}$  to  $39^{\circ}$  Fahr.), though we were in the proximity of the ice. From this I concluded that a current from the South predominated here, because I never before, in the vicinity of ice had found the temperature of the water exceeding  $1^{\circ}\cdot8$  R. ( $36^{\circ}$  Fahr.), and this conclusion was confirmed when, coming to the northward of the ice, I found the temperature of the water  $1^{\circ}\cdot1$  + R. ( $34^{\circ}\cdot5$  Fahr.)."

† Besides the evidence afforded by the ice-drifts and the temperature of the water, as cited by the author, conclusive proof of a northerly set is found in the driftwood which has been so frequently met with around Cape Farewell and off the W. coast of Greenland. A few examples will suffice. A plank of mahogany was drifted to Disco, and formed into a table for the Danish governor at Holstenborg ('Quarterly Review,' No. xxxvi.). Admiral Löwenörn picked up a worm-eaten mahogany log off the S.W. coast of Greenland. These in all probability were transported from the S.W. by the Gulf-stream. Captain Sir Edward Parry, in his second voyage, September 24th, 1823, picked up a piece of yellow pine quite sound, in lat.  $60^{\circ} 30'$ , long.  $61^{\circ} 30'$  W.; and on his third voyage seven pieces of driftwood were found in the vicinity of Cape Farewell. Again, Captain Sir John Ross found much driftwood around Cape Farewell; and Captain Sir George Back saw in lat.  $56^{\circ} 50'$ , long.  $36^{\circ} 30'$ , a tree with the roots and bark on. These instances might be multiplied, but their character indicates a southern origin.—Ed.

‡ Sir John Ross, in his first voyage, May 23, found the current to run 5 m. per day to the S.W. in lat.  $57^{\circ} 2'$  and long.  $43^{\circ} 21'$  W. (or about 168 m. S. of Cape Farewell), and N.W. when 140 m. S. by W. of the Cape.

Sir Edward Parry, on June 19, 1819, when 130 m. due W. of Cape Farewell, found its direction and velocity to be a  $50^{\circ}$  W. 6 m. per diem.—Ed.





Map of  
DAMASCUS, HAURAN, ANTI-LIBANUS &c.  
to illustrate a Memoir by  
The Rev<sup>d</sup> J.L. Porter A.M.



This current afterwards runs northward along the s.w. coast of Greenland until about lat.  $64^{\circ}$  N., and at times even up to Holsteinborg, which is in about  $67^{\circ}$  N.

This current undoubtedly afterwards, by turning to the westward, unites with the current coming from Baffin and Hudson Bays, running to the southward on the western side of Davis Strait along the coast of Labrador, and thus increases that enormous quantity of ice which is brought towards the s. to Newfoundland and further down in the Atlantic Ocean, frequently disturbing and endangering the navigation between Europe and Northern America.

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V.—*Memoir on the Map of Damascus, Hauran, and the Lebanon Mountains.* Constructed, from personal survey, by the Rev. J. L. PORTER, A.M., F.R.G.S., and M.R.S.L.

Communicated by JOHN HOGG, Esq., M.A., F.R.S., F.R.G.S.

Read, November 26, 1855.

No section of Syria has hitherto been so much neglected by the geographer as the environs of Damascus. The brief notes, and even the few errors of *Burckhardt* have, since his time, been handed down through each successive generation of authors and cartographers, without alteration or addition. The consequence is, that on all the maps hitherto published, the great plain surrounding the city, though teeming with large villages, is almost a blank, and the few places that are inserted are not in their true positions. The mountain chain of Antilibanus also is distorted and misplaced; the rivers of Damascus are mere fancy sketches, and the *three* lakes, into which they empty their waters, have been thrown into *one* for the sake of unity.

When I began, in the year 1850, to traverse the country, I felt the want of an accurate map; and as business led me frequently to travel up and down the valley of the Barada, the idea occurred to me of delineating its course, at least from its fountain to the city. I immediately commenced a series of observations with a large compass, for which the nature of the district was well adapted. From a little wely that crowns the brow of the ravine through which the river enters the plain, I could see the sublime gorge in the central mountain chain at Sûk; and from a commanding position beside Neby Hâbil (*Prophet Abel*), at the mouth of this gorge, I saw a conspicuous landmark that showed the position of the great fountain in the plain of Zebdâny. My residence at Bludân afforded many opportunities of noting the features and directions of the mountain chains that encompass this beautiful



plain. Distances were calculated from carefully-kept itineraries. Thus, Damascus being taken as a fixed point, I constructed the sketch-map of the Barada—the ancient *Abana*.

While tracing the course of the river I made a series of observations with the aneroid, to ascertain the amount of its fall and the elevations of the mountain-chains around, of which the following is the result.

The mountain-range on the east side of the plain of Zebdány is the central ridge of Antilibanus, and has an average elevation of about 6000 ft.; one of its peaks, 8 m. N.E. of the fountain of the Barada, attains an altitude of 7000, and is, with the exception of Hermon, the loftiest in the whole range. The ridge on the western side of the plain, which has been represented as the main one, is considerably lower, and rapidly decreases in altitude as it runs N.E. towards the ravine of the Yahfúfeh. Its average height is not over 5000 ft. The plain of Zebdány, at the fountain of the Barada, is 3343 ft. above the level of the sea. The river falls 70 ft. between its source and the ruined Roman bridge at the foot of the plain. From the latter point to the modern bridge above Súk the fall is 251 ft.; from hence to the village of Judeideh, on the plain of Sahra, it is 563 ft.; and hence to Damascus 265 ft. The whole fall, therefore, from the fountain to the city is 1149 ft., and the distance being about 23 Roman miles the fall is nearly 50 ft. to the mile.

As I resided during the summer months at Bludán, and had occasion frequently to visit Damascus, I had the opportunity of surveying another deep valley that descends the eastern slopes of Antilibanus, parallel to the Barada. It is called Wadi Helbon, from a village of the same name, which I have elsewhere shown to be identical with the Helbon of *Ezekiel*, famous for its wine. Other short tours across the wild country between these valleys enabled me to complete a rough map of this section of the mountain range, and one result of these surveys was to prove that the valley of the Barada and the plain of Zebdány, viewed in relation to Damascus, had been hitherto placed too far westward.

My next important journey was made in September 1852, and the objects I had in view were,—1st. To ascertain the general formation of the southern section of the Antilibanus range and the courses of the several parallel ridges that constitute it; and, 2nd. To discover the sources and explore the upper valleys of the river 'Awaj, which I felt persuaded is identical with the ancient *Pharpar*.

I started from Bludán, and travelled through the mountains to Rasheiya at the foot of Hermon, taking bearings of every village and prominent mountain peak as I passed along, and connecting them with the section previously surveyed. From Rasheiya I

ascended Hermon, and spent a night on its summit. From this commanding point the whole southern section of Antilibanus was spread out before me like an embossed map. I sketched the leading features, and took careful bearings of nearly every village, correcting the angles by a pocket-sextant. I likewise took bearings of two very conspicuous conical hills on each side of the plain of Damascus—Tell Mánia and Jebel Ziníyeh. These observations I found of the greatest importance, not only in laying down but also in shading the mountain ridges.

From the eastern brow of Hermon I looked down an unbroken declivity of some 6000 ft. to the bottom of a profound valley that opens up the giant mountain to its very centre, and there I saw distinctly a number of little fountains, the waters of which unite half an hour farther down beside a village called 'Arny, and form a large stream. This stream flows about due E. through the ravine for about 5 m., passing the villages Rimeh, Khirbek, and Bk'asem, and then enters the plain, where it turns s. by e., and winds over it by Kefr Hauwar to Sásá. This is the north and principal branch of the river 'Awaj, and is generally called Nahr 'Arny.

After visiting the sources of the Jordan at Hasbeiya, Tell el-Kády, and Báneas, I travelled round the southern base of Hermon to the little village of Beit Jenn. It is situated in the bottom of a deep and wild ravine, and in the sides of the cliffs above it are numerous excavated tombs. A fine stream flows down the glen from a fountain about an hour westward at the base of the great mountain ridge. I followed the course of this stream down the valley, and in a quarter of an hour came to another large fountain on its right bank. In 15 minutes more the united waters enter the plain, and flow across it, in a deep bed, e. by s. to Sásá, where they unite with the Nahr 'Arny.

I now rode along the base of the mountains to Kefr Hauwar, on the banks of the latter stream, where De Sauley attempts to prove that the Roman road from Damascus to Cæsarea Philippi followed this route; but a little observation, as he passed along, might have shown him that there is not a trace of an ancient road along the whole line, and that the nature of the ground, especially between Beit Jenn and Mejdél, is such as Roman engineers would never have selected except from absolute necessity; and a little reading would have informed him that the Roman road was discovered many years ago, and is referred to by *Irby* and *Mangles*. It runs from Báneas, by Lake Phiala, to Kuneiterah, and thence by Sásá to Damascus. De Sauley again brings forward many learned arguments to prove that Kefr Hauwar is identical with the *Aere* of the Itinerary of Antonine, and that Beitimah, a neighbouring village, occupies the site of the *Ad Ammontem* of the



Peutinger Tables; but his arguments are again unfounded. The road of the Itinerary is entirely different from that of the Peutinger Tables, and further, *Aere* has been identified with Sunamein, on the Haj road, as Ritter has shown in his 'Erdkunde.'

Following the road across the Nahr 'Army and along the base of Hermon to Katana, I searched in vain for the river Berdy, laid down in Burckhardt's map, and of course on all others since published. This river is purely imaginary; there is, indeed, a little canal of this name, the waters of which are collected by a subterraneous aqueduct near the village of Ashrafiyeh, about a mile w. of the Haj road, and are conducted a few miles eastward to irrigate the gardens of Baweidah. It is in every respect like a score of others the traveller may see on the plain of Damascus.

During my next tour I extended my surveys towards the N.E. and E. along the slopes of Antilibanus. This section of country is almost entirely new ground; few have visited it, and none have as yet attempted any detailed description. I had previously passed through it on my way to Palmyra, but it was during the present journey that I thoroughly explored it.

Passing through Burzeh, at the entrance of the wild ravine of Māraba, I ascended the Jebel Salahiyeh in the track of an ancient road. After crossing the Sāhrā and another barren ridge, I reached the castellated convent of Saīdnāya. Above it is a mountain, called Mar Shurabin (*St. Cherubim*!), containing a number of small oratories now in ruins. These, I presume, are the convents with which Berghaus has adorned this part of his map of Syria. It is enough to say that not one of them occupies its true position. Saīdnāya is manifestly a site of remote antiquity, and an Arabic MS. in my possession identifies it with *Danaba*, an ecclesiastical city, and also mentioned by Ptolemy. I next rode to Jubb 'Adin, where I wound through a range of hills by a pass of singular wildness and grandeur, and continued my route to Mālūla, which occupies a most romantic position at the entrance of a sublime glen, and which is remarkable as one of the three villages in which the *Syriac* language is still spoken.

From the summit of a towering cliff above the village I obtained a commanding view over the whole district, and was able to obtain a clear conception of the features of the mountain chains. The eastern slopes of Antilibanus are here composed of a series of terraces. The highest is about 9 m. broad, and runs along the base of the great central chain. I now stood on the brow of its supporting wall, which commences at the head of Wady Helbon, and extends N.E. by E. to Nebk, where it sweeps round to the N. and approaches the main chain. The supporting wall of the second terrace, which embraces the plain of Saīdnāya, commences

at Menin; and the wall of the third terrace, or plain of Sâhrâ, is the Salahiyyeh range. The fronts of these several ridges are in most places walls of naked rock, and they have thus a singular appearance, somewhat resembling the crests of so many broad waves. They do not run in parallel courses, but open out like a fan, having Hermon for their centre.

From Málûla I rode to Yabrûd, a large village, situated at the entrance of a wild ravine. It occupies the site of the *Jabruda* of Ptolemy, and of the Notit. Eccles. The remains of one of the earliest churches in Syria may still be seen in the bevelled stones of its cathedral. Here we turned southward to Kustul, where we struck the great caravan-road, which we followed to Kuteifeh. From hence we crossed the lower mountain-range in a south-eastern direction to Maksûra, the last village towards the desert in the plain of Damascus. This enabled me to see the features of a large district hitherto unexplored.

At Maksûra, or *Dumeir*, as the Turks call it, are the ruins of a handsome temple, erected in the time of the Emperor *Philip*, as may be seen from an inscription already communicated to the Royal Society of Literature through Mr. Hogg.\* Half an hour eastward are the foundation and prostrate ruins of a considerable town, apparently of the Roman period. In the Itinerary of Antonine there is a Roman road mentioned, with stations and distances as follows:—Geroda to Telsea, M. P. xvi.; Damasco, xxiv.; Aere, xxxii.

*Geroda* might possibly be represented by the modern Jerûd, a large village on the caravan-road to Palmyra. From Jerûd to Maksûra, through the valley of the Mukubrit, is just 16 m. and from hence to Damascus is 24 m. These facts render it probable that this may be the site of the ancient *Telsea*.†

The lower parts of the "rivers of Damascus" and the eastern and southern section of the plain still remain unexplored. During the month of November, 1852, I made an excursion into this region with a few friends. We followed the right bank of the Barada from the city to where it forms a kind of delta and falls into the lakes. This river, after passing through Damascus, runs across the rich plain in a winding course nearly due E. Numerous canals are led off from it, both above and below the city, to irrigate the plain. At the distance of about 14 m. a small branch runs off to the N.E., and falls into the *east* lake—El-Bahret esh-Shurkiyyeh. Nearly 2 miles beyond this the main channel divides into two branches, both of which fall into the *south* lake—El-Bahret el-Kibliyyeh, a mile and a half distant from each

\* See vol. v. part li. † Transactions of the Royal Society of Literature for 1855.

† Generally written *Thelaca*, or *Thelaca*.—J. H.



other. The south lake appeared like a vast expanse of marsh, covered with forests of reeds, and having spots of clear water at intervals. From numerous observations, I estimated its length at about  $6\frac{1}{2}$  m., and its breadth  $5\frac{1}{2}$ . Along its northern and north-eastern border is a belt of elevated ground, covered with groves of the tamarisk, averaging more than a mile in breadth. Beyond this lies the east lake, similar in appearance to the other; it is about  $8\frac{1}{2}$  m. long by 4 broad, but its borders are not so clearly defined as the south lake. A narrow wadi, like a canal, unites the two, but otherwise they are always separated. The aspect of these lakes is quite different during the winter and spring, as the water then almost completely covers the reed-forests. The ground has a gradual slope upwards from their eastern borders to the base of a line of hills called the Tellúl. Here there are no settled inhabitants, nor could I see the remains of any villages, but I observed three large ruins, like castles, in the distance.

On the southern side of the south lake there is a gentle swell in the plain, about 3 m. in breadth, and beyond this is another lake, or extensive marsh, called Bahret Hijáneh, about 5 m. long, by  $4\frac{1}{2}$  broad. Into it the river 'Awaj empties its waters, and the winter stream, that descends from the Jebel Haurán through the Wadi Liwa, also enters its s.w. corner.

It will then be observed that instead of *one* lake, which previous geographers have been pleased to call *Bahr el-Merj*, or Lake of the Meadow, and into which they have compelled all the real and imaginary rivers of the whole region to flow, there are in reality *three* lakes. To enable me to lay down these and the courses of the Barada and 'Awaj on the map, I took numerous bearings and kept careful itineraries. I also connected this district, by means of the conspicuous points Tell Mánia, Jebel Tiniyeh, and Hermon, with the other sections surveyed.

The next journey I made was more extensive than any of the preceding, and through a country still more interesting in an historical or antiquarian point of view—the ancient kingdom of *Bashan*. The results of this tour, in so far as the geography is concerned, I shall give in a few sentences, referring those who may desire a detailed account of the antiquities, history, and inhabitants to my work entitled 'Five Years in Damascus.'

A perusal of Burckhardt's notes and of the rough sketches of Buckingham had given me some idea of the general features of the Haurán, and of the almost innumerable ruined and deserted towns scattered over it; while a careful study of the Bible, the writings of Josephus, the geography of Reland, and the '*Palästina und Syrien*' of Ritter, prepared me for an attempt to define the situation and boundaries of the ancient provinces and to identify some of the sites of ancient cities. The lists attached to Robinson's

'Researches' are, in this latter respect, of very great value, and, before setting out, I was fortunately able to complete them from authentic sources. To prepare more especially for the construction of a map, I took a sketch of Burckhardt's for constant reference, to enable me to observe and note on the spot every inaccuracy or deficiency. A short time previous to my visit, Fezzy Beg, a Turkish officer of Engineers, formerly in the Hungarian service, had surveyed a portion of the Haurán, and through the kindness of my friend General Guyon (Kurshid Pasha) I obtained a copy of it, which I also carried with me. I soon discovered that the latter map, though it contained some new and useful matter, was not constructed with any degree of care or accuracy. Thus equipped, and having my sextant, a large and also a small compass in my pocket, I set out.

Crossing the river Awaj by a substantial bridge at the village of Nejha, and surmounting the eastern spurs of Jebel Mánia, I traversed the hitherto untrodden plain, to the deserted town of Burák, on the N.E. corner of the Lejah. From hence I followed the right bank of the Liwa, along the side of the wilderness of rocks, to the northern base of the Jebel Haurán. I here visited the remains of the ancient ecclesiastical city of *Batanea*, situated on the declivity of the mountains, commanding an extensive view over the great plain that extends uninterrupted to the Tellúl. I was here able to correct some errors of Burckhardt in his description of the towns in this district, which he did not visit, and likewise those of Berghaus.—1st, in representing the Safa as a mountainous region; and 2nd, in placing it immediately on the N. side of the Jebel Haurán. The Safa is a rocky plain like the Lejah; and it is situated a day's journey E. by N. of the Jebel Haurán.

I next visited the extensive ruins of Shuka, the *Saccasa* of Ptolemy. From a survey of the situation of this town and the topography of the mountain range above it, compared with the statements of Ptolemy, I was led to conclude that the *whole range* of Jebel Haurán, and not the *single peak* Kuleib, or little Heart, is the ancient Alsadamus Mons. The district which comprehends this mountain range is now called *Ard el Bathanyeh*, "the Province of Bathanyeh;" and this fact, combined with a careful examination of ancient authorities, convinced me that this province is identical with the ancient *Batanaea*, which geographers have hitherto located on the banks of the Yarmuk, far to the westward. The arguments by which I prove this point may be seen at length in the 'Journal of Sacred Literature,' and also in my work 'Five Years in Damascus.'

Proceeding in a south-westerly direction along the base of the mountains, I examined the ruins of Shuhba, and took such bearings



from a lofty tell beside them, as served to fix the position of the s.e. corner of the Lejah, and the courses of the valleys Nimreh and Liwa. At the ruined town of Suleim, about 4 m. s.w. of Shubba, I copied a long Greek inscription from a beautiful temple, containing the following line :—

ΕΝΕΛΛΟΙΝΕΟΗΘΑΤΗΛΟΙΚΟΔΟΜΗΕΝΕΥΤΥΧ.\*

We know from the *Notitia Ecclesiastica*, that there was a *Neapolis* in this district, which is generally mentioned in connexion with Canata and other towns in the neighbourhood. It is highly probable that Suleim occupies the site of that city.

In my route from this place by Kunawât, Suweideh, and 'Ary to Busrah, I travelled in some places along, and always near a fine Roman road. I was credibly informed that it runs through the Lejah in nearly a straight line from Musmeih; and I saw afterwards several traces of it between that city and Damascus. These facts led to an important discovery at an after period. I was naturally anxious during my surveys, and in the drawing up of my map, to identify, as far as possible, the lines of Roman roads as given by ancient geographers. When the map was completed, and the road, here referred to, laid down, it struck me at once that a highway, connecting such important towns, must have been referred to by ancient authors. Turning to the *Peutinger Tables*, I found a road, which I had not yet been able to identify, which is as follows :—*Damasco, Aenos*, P.M. xxvii; *Chanata*, xxxvii; *Rhose*, xx.

There can be no doubt that *Chanata* is the ancient Kenath, and the modern Kunawât; and its distance from Damascus, as laid down on my map, is just 64 Roman m. And on measuring 27 m. from Damascus southward along the road referred to, I found that the point of the compasses rested on Musmeih. But Musmeih has been identified with *Phaenos*, the former capital of Trachonitis; and it is easy to see how the accidental blotting of a single letter (Φ) would change *Phaenos*, into *Aenos*. It may be seen by the map, that from Kunawât to Busrah is just 20 Roman m.; and it is highly probable that from the inaccuracy of a transcriber, or the dimness of age, Bostra may have become *Rhose* (Βόστρα, Ρωσση).†

Between Suweideh and 'Ary I corrected an error in Burekhardt's

\* This line completed would be :—

Ἐνελὸν Νεαπόλιν ἐκδόσαντες ἰσχυρῶς.

That is, " *Enonho*, an inhabitant of *Neapolis*, built (this monument) fortunately." There is nothing, however, to fix its date. See further, part 2, vol. v., *Trans. Royal Society of Literature*, 1855.—J. H.

† *Rhose* may be easily corrupted from *Bostra* thus: the Septuagint translation of *Bostra* is Βωρίη, Βωσίη, which in time might be erroneously written Ρωρίη, Ρωσση; and so Ρωρίη, Ρωσση, might come into use.—J. H.

map. He made two journeys between these towns, but *by different routes*. In the first he went round by Sehweh, and was five hours on the road; in the latter he went direct and was only half the time. His cartographer, not understanding the circumstance, appears to have struck a mean between the two; and therefore 'Ary is much too far s. Burckhardt's itinerary from 'Ary to Hebrán, I also found very incorrect. 'Ary is most probably the *Καμὴ Ἀγίαθας Τραχανός* of the 'Notitia Ecclesiastica.

From Busrah a number of ancient roads radiate in straight lines. One runs over the plain to Ghisam, and extends, as I was informed, to Der'a, the *Adraa* of Eusebius; and this is doubtless the road laid down on the Peutinger Tables. The distance, 24 m., agrees exactly with my map. Another road runs straight, as an arrow, to Sulkhad, the strong fortress of which is clearly seen crowning a conical hill in the distance. Along the latter I travelled to Sulkhad, the ancient *Salcah*. From the summit of the castle, the view is extensive and interesting. Towards the E. and S. a plain stretches to the horizon, and is thickly studded with deserted towns and large villages; upwards of thirty were in sight. Here is a most inviting field for the enterprising traveller. A fine straight road runs across the plain in a direction S.E., and a tradition, older than the time of Abulfeda, says that it extends to Irak and Baghdad. May this not be the channel along which the great tide of commerce flowed from the East, in the days of Bostra's prosperity?

From Sulkhad I returned to Kureiyeh, where are the remains of a large and very ancient city. Its name, position, and manifest remote antiquity, suggest its identity with the *Kerioth* of the plain of Moab, mentioned by Ezekiel in connexion with Bozrah, and Beth-gamul. Turning from this place toward the lofty peak of the *Kuleib*, I ascended the mountains to Hebrán, which is admirably situated for a point of observation, as it commands the whole country from 'Ary to Busrah, and from thence to Sulkhad. I also saw from it the Castle of Schwet el-Khudr. I here detected a very serious error in the map of Burckhardt. In going from Hebrán to Zaele, or rather Sáleh, he passed over the *whole breadth* of the mountain-chain to the eastern plain; but in returning thence to Schwet el-Khudr, he recrossed only an eastern ridge. The *plain* into which he descended from the latter town is in reality only a valley, which divides the mountains from El Kuleib southwards. Down this valley he rode in two hours to Ayoun ('Ayún): now 'Ayún is only half an hour distant, *due north*, from Sulkhad, whereas, in Burckhardt, the distance is represented at 2½ hours. In his map this distance has not been properly laid down; but still the distance there is much too great, being nearly 2 hours. Here there is no error on Burckhardt's part, there is



merely a want of sufficient fulness in not giving *directions* as well as *distances*. From 'Ayûn he turned nearly *due east* and recrossed the ridge to the ruined town of 'Orman, which he reached in 2½ hours; and from thence he returned w. by s., in 1½ hour to Sulkhad. Instead of 4½ hours, therefore, Sulkhad is only 2½ hours from Schwet el-Khudr. These observations have led me to bring Busrah, Sulkhad, and the whole southern section of the Jebel Haurân considerably farther north than they have been hitherto placed by geographers.

My route from Hebrân led me back again to Suweideh and thence across the plain of Auranitis to Nejrân, a large ruined town, within the borders of the Lejah. From thence I skirted the edge of this singular region to Edhr'a and Khubab, and then crossing the plain on the n. to Deir 'Aly, proceeded by Kesweh to Damascus. The observations I made at Nejrân and Edhr'a were unfortunately lost in an encounter with the fierce Muslims of the latter place; but I had noted that the map of Fezzy Beg was here more trustworthy, and I afterwards obtained a large amount of information from intelligent natives. Burckhardt's map is very incorrect in this district. The relative positions of Edhr'a, Eshmiskin, and Nawa are totally wrong, and their distances out of all proportion. I have defined the boundaries of the ancient provinces of Auranitis and Trachonitis; but as the arguments in favour of my views are given at length in my work on Damascus, I will not here repeat them.

The Lejah is by far the most remarkable part of this interesting country. It is of an irregular shape, about 22 m. long by 14 wide, and the whole circumference I estimated at 58 geographical m. Its border is everywhere as clearly defined as the line of a rocky coast, which indeed it very much resembles with its inlets, bays, and promontories. At the south-east angle the stony ground extends out from it to the base of the mountains, and the border is not so apparent; there is this distinction, however, between the one and the other, that, while the plain is only stony, the Lejah has, in addition to the stones, a stratum of rock covering nearly the whole surface. The general surface is elevated from 20 to 30 ft. above the surrounding plain. At a little distance it appears as flat as a sea; and there are only two little conical hills in it, the loftiest of which is not above 300 ft. in altitude.

The Lejah is wholly composed of a black basaltic rock, which appears to have, in some past age, issued from pores or fissures in the earth in a liquid state, and to have spread out on every side until the plain was almost covered. Before cooling, its surface was agitated by some fearful agency; and it was then shattered and rent by internal convulsions. The cup-like cavities from which the liquid mass was projected are still seen; and likewise the

wavy surface, which a thick liquid generally assumes as it cools while flowing, is very distinct. The recent lava-stream which I saw on the side of Vesuvius was in some places similar in appearance to the surface of the Lejah; and the blasted desolation of that mountain where covered thickly with shattered fragments of the black rock, and deeply seamed with yawning ravines, strongly reminded me of this dreary region. Strange as it may seem, however, the whole province is studded with deserted cities and villages, in all of which the dwellings are solidly built, and manifestly of remote antiquity, and in not a few are stately monuments of a later and more polished age.

I thus traversed the whole region between the Haj or Pilgrim road and the borders of the desert in such a way as to enable me to cover it with a network of bearings, embracing all the more important towns and villages. And these I connected with the well-defined summits of Hermon and Mánia, and afterwards with several places in the plain of Damascus, from which I took bearings of the Kuleib and Tell Khaledíyeh.

The provinces of Jaulán and Jedúr I have not yet explored. I have delineated them on the map, partly from some distant bearings, connected with information received from intelligent natives; and partly from the map of Fezzy Beg and the routes of Burekhardt and Captain Newbold. I have not, by any means, the same confidence in the accuracy of this section, as of that I visited myself.

The Roman road from Damascus to Neve I have laid down, as traces of it still exist. The distance of the former city from Aere, as given in the Itinerary, agrees with my map; but that between Aere and Neve is much too great. I attempt no solution of the difficulty.

A journey from Bludán to Beyrout by Zahleh, and back again by the Cedars and Baalbek, connected with several minor tours, enabled me to run a series of triangles up the great valley of the Bukaa as far as Baalbek, and thus to connect Libanus with Antilibanus; and during a subsequent journey to Hums, I carried my survey round the northern end of the latter chain. I first crossed the mountains from Saidnáya to Baalbek, and then travelled along their base to Lebweh and Ras Baalbek. From the latter place I rode over the plain to the great fountain of the Orontes, and re-crossed it to examine the extensive ruins of Júsy. From Júsy I went to Ríblah, and then followed the right bank of the Orontes to Hums. I returned to Damascus by the caravan-road as far as Nebk, and afterwards *viâ* Malula.

Observations were made during these journeys from two points on the summits of Antilibanus, to connect the plains on each side, and to determine the true course of the central chain, which runs in nearly a straight line, *s.e.* by compass from Hermon. From



the lofty mountain peak above Bludán, I saw the exact position of Damascus on the one side, and the columns of the great temple at Baalbek on the other. Bearings, taken from this point therefore, at once served to check and verify the lines of three different routes I had followed between these cities, which, when laid down on the map, had somewhat surprised me. Baalbek I now found to be  $n. 12^{\circ} w.$  of Damascus, instead of nearly  $n.w.$ , as represented by Berghaus and others. It is remarkable that so great an error should thus long have escaped the notice of scientific men. Any observant traveller can see, at a glance, that the plains of Zebdány and Surgháya, and the long Wadi Marabún, are all in a direct line, extending nearly from  $s.w.$  to  $n.e.$  by compass. Yet hitherto the route from the southern end of the plain of Zebdány towards Marabún has been represented as running due  $n.$ , and on some maps  $n.$  by  $w.$  Dr. Wilson took bearings from a ruin called Khan Bunduk on the eastern side of the plain of Zebdány, and again from the head of Wadi Marabún, which tend to confirm my statement. Mount Hermon bore from both places  $s.w.$  by  $s.$ , and hence it is plain that he must have travelled from the one to the other in a direction  $n.e.$  by  $n.$  He draws the rather remarkable conclusion that he must have proceeded due  $n.$  in the interval; and even his cartographer appears to concur in this view.

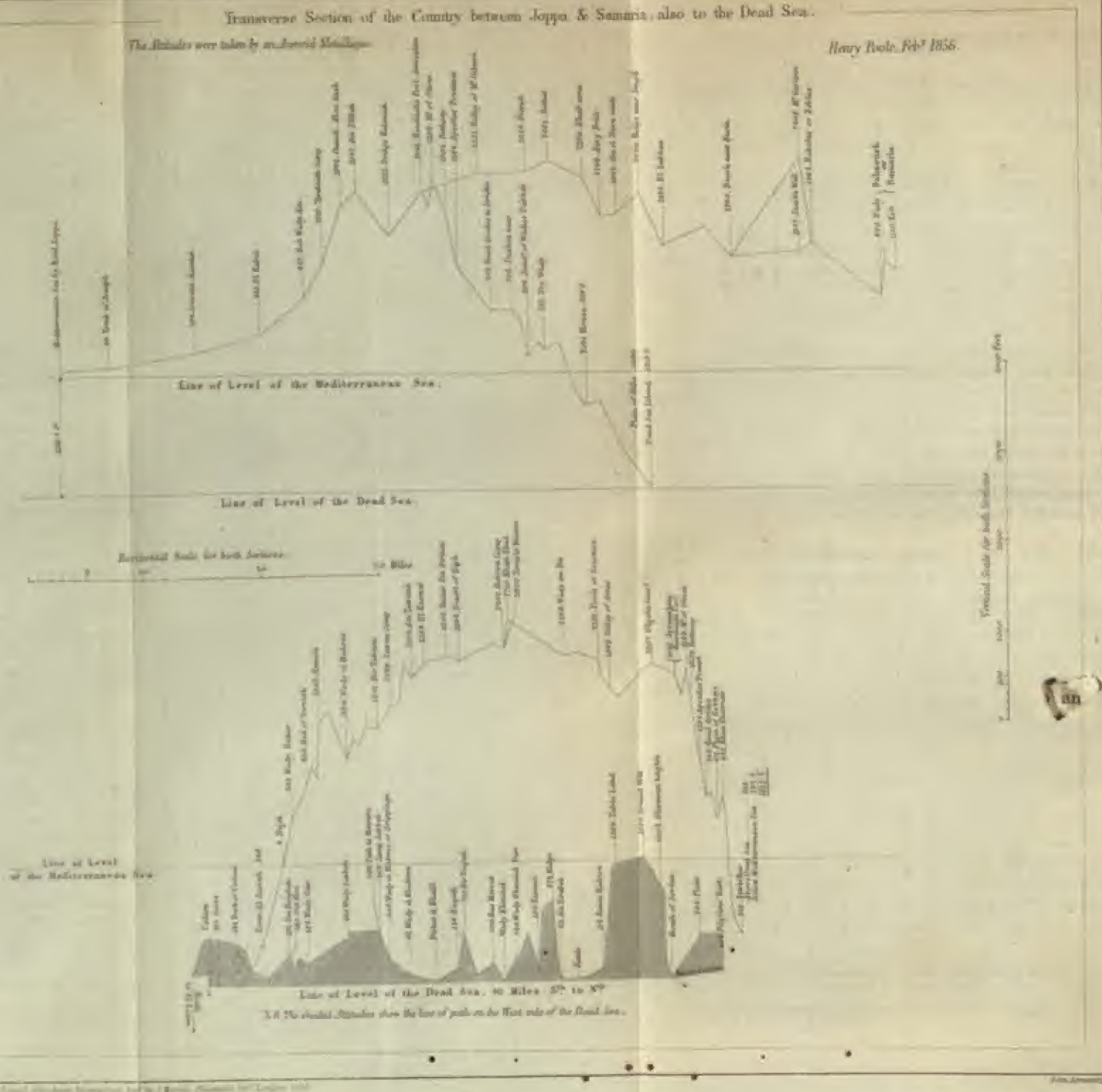
From a point in the Bukaa, about 7 m. above Baalbek, I obtained a view, and took a bearing of the monument of *Hurmul*, which, from its commanding position, forms an admirable station for the surveyor. From *Hurmul* I took the angles of the summit of Hermon and the castle-hill of Hums; while from the latter almost every village in the surrounding plain was visible, and likewise the course of the caravan-road to Damascus for a distance of more than 20 m. The Tell Mindow is also an important station; a bearing of it from the village of Shemsín served to connect the caravan-road with the banks of the Orontes. There is also a very remarkable gap through the northern end of Antilibanus, which, as it is seen distinctly from both sides, serves to connect the routes I followed going and returning.

It will be seen that the range of Antilibanus is removed much farther eastward than it appears on former maps; and it has also been extended more than 15 m. farther into the plain of Hums. This range now terminates in *long.*  $36^{\circ} 50'$   $e.$ , and *lat.*  $34^{\circ} 25'$   $s.$ , instead of, as represented in Berghaus' map,  $36^{\circ} 20'$ , and  $34^{\circ} 10'$ ; a correction is thus made of *half a degree* in *long.*, and a *quarter of a degree* in *lat.*

In constructing the map as it now appears, I first endeavoured to fix the true positions of Damascus and Baalbek. In doing so I had no very satisfactory data on which to work, since I was









obliged to correct their positions, as assumed by the best authorities, in order to make them agree with my own observations. Having laid down these places, I constructed the several routes I had followed between them, and thus fixed with care the station on the summit of the lofty peak above Bludán. I then laid down the stations of observation on Hermon, Jebel Tiníyeh, Tell Máni'a and Tell es-Salahíyeh, from each of which, with the exception of the second, *I had taken the angles of all the others.* On the basis thus formed, I constructed the whole from my itineraries, and very numerous bearings.

It will thus be observed, that the map has no claim to strict accuracy, as there were no points *within the bounds of my survey*, astronomically fixed to serve as a *basis*. I have endeavoured, however, to approximate as closely to the truth as possible; and I have been careful to delineate with accuracy the *relative positions* of the several provinces, cities, and villages.

It has often been to me a subject of regret that, from the want of the requisite instruments, I have not been able to improve the many opportunities I have had of ascertaining from astronomical observation, the true position of many important towns in this interesting country. Were the latitudes and longitudes of Damascus, Hums, Busrah, and a few other places ascertained, an accurate and full map of this section of Syria could now be constructed. This, however, I can scarcely hope to accomplish, for I have already found it to be rather an expensive amusement to conduct scientific investigations in a country like Syria, where one is dependent wholly on his own resources.

## VI.—*Report of a Journey in Palestine.* By Mr. HENRY POOLE.

Communicated by the EARL of CLARENDON.

September 27, 1855.—Leaving Constantinople for Jaffa by the steamer, we stopped a short time at Gallipoli, the Dardanelles, Tenedos, Mitylene, Smyrna, Chio, Rhodes, Marsine, Alexandretta, Latakia, Larnaca in Cyprus, to land and take in goods and passengers.

October 7, Sunday.—Arrived at Beyrút.

October 9.—We stopped for a short time at Mount Carmel, and anchored off Jaffa at 3 P.M.

October 10.—The Vice Consul arranged about engaging horses to take us to Jerusalem. He informed me that 150 okes or 400 lbs. were a camel's load from Jerusalem; the charge for carriage 25 piastres or 4s. 2d. per load. The charge for storage was 10 piastres or 1s. 8d. per load for a reasonable time; the



season for shipping from Jaffa was from June to November. The principal imports were salt and manufactured goods; the exports were cotton and grain; population 25,000. I left Jaffa at 4 P.M. and passed between hedges of prickly pears, protecting orange-trees loaded with fruit, for some distance; the soil appeared to be red sand, and where rock showed it seemed to dip to the east. The ground rose gradually until we came to Ramleh at 7 P.M., where we rested at the house of the Consular Agent.

*October 11.*—I left Ramleh at 1:30 A.M., and rode over cultivated ground: at 4 A.M. we began to ascend the mountain-pass; the rock was limestone, dipping about  $8^{\circ}$  to  $10^{\circ}$  W.; we reached the summit at 6:30 A.M., passed the village of Abú Gosh, and a church in ruins at 7 A.M., as we descended on the E. side of the mountain. At 7:30 we reached a spring, where the limestone had a slight dip to the E.; we then crossed another hill of limestone; passed over a stone bridge, near the village of Kulonia, and arrived at Jerusalem at 10:30 A.M. By aneroid the bottom of Hezekiah's Pool was 2064½ ft. above the level of the Mediterranean. Bedouins came with camels loaded with raisins, very large and luscious; also carbonate of potash from the district of Salt to the east of the Jordan.

*October 17.*—At 7:30 A.M. I felt three smart shocks of an earthquake at Jerusalem. At 3 P.M. I went to meet Mr. Consul Finn returning from his tour, and accompanied Mr. Graham on his way to Damascus, as far as Nablus. We rode out at the Bethlehem Gate; over Scopus, by the base of Mount Gibeon, through Rám-Allah, and camped at Bireh. Limestone rocks prevailed the whole way, and a good deal of the country was cultivated in terraces.

*October 18.*—I got some shelly limestone before leaving Bireh. The rock on the top of the hill was nearly flat, slightly inclined to the E.; large cleared spaces are used for threshing floors. In an hour and a quarter we arrived at Bethel, where is a large pool in ruins, also a tower. On the top of the hill were large masses of blue limestone with shells. An hour later we passed near Ain-y-Borek, where the mountain-road was by the side of a precipice; the mountain appeared to have been split, for the stratification on both sides of the ravine corresponded. Another hour's ride brought us to Ain-el-hara-mich, or the Robbers' Spring, in a narrow defile. The perpendicular rocks were curiously marked, as if by torrents of water, by deep longitudinal grooves up to their summit. We passed the Khan-el-Liban, then rode over an extensive plain, near to Burin, and reached Nablus at 7:30 P.M., situated on the E. side of Mount Gerizim, whence it is well supplied with springs of water.

*October 19.*—I went to the top of Mount Gerizim, and during the ascent got nummulitic limestone; in some parts the rocks had

been in a liquid state, for one kind had overflowed and encased another. By aneroid, the summit was 2412½ ft. above the Mediterranean, and 1274 ft. above Nablus, to which we returned at 7 P.M.

*October 20.*—I rode to Samaria, passing through a great deal of fertile, well-watered country, and observed that the springs of Nablus were the summit sources of streams flowing both ways, to the Jordan and to the Mediterranean. Most of the way between Nablus and Samaria is covered with masses of flint, called by the inhabitants chalcedony. The hill of Samaria is composed of limestone.\* The land appears to be fertile, and I saw a great many mistletoes on the olive-trees; indigo and sesame were also grown in the valley.

*October 22.*—I left Nablus in company with Mr. Finn at 9-20 A.M., and visited Jacob's Well and the tombs of Joseph and Eleazar; the rocks were everywhere limestone; we reached Bireh at 8 P.M., where we camped for the night.

*October 23.*—We left Bireh at 9 A.M. and returned to Jerusalem.†

*October 24.*—I called on the Consul, and arranged through him with Mattien Fadlallah for horses, tents, and provisions for the Dead Sea; he also sent a messenger to Abû Daouk, sheikh of the Djahalins, for a guard, as we had to pass through his territory; also sent to Elijah Mashallam to ask him to accompany me, and act as interpreter.

*October 25.*—I visited the tombs and other remarkable sites around Jerusalem, while waiting for the arrival of the guard of Arabs.

*October 26.*—At 8 45 A.M. I left Jerusalem and rode through Bethany: the limestone dipped about 15° to the E. At 11-05 the road to Jericho branched off to the E. We soon after passed near the ruined Khan-el-Lachmé, where white nodules with black flint in the centre were thickly strewn about. At 11-45 we passed Durbez-zuar; saw Tirb-rearché to the E. At 12-30 came to the junction of valleys Dubbak and Cavern of Hiram-em-Dowrah; the cisterns in limestone were dry. Thence we rode S.E., and ascended a hill where chalk was vertical with a yellow tinge; strike N.N.W. and S.S.E. The road was through barren hills and steep ravines, and at 1-15 P.M. we passed a curious pinnacle of sharp broken rocks; at 1-45 we crossed a ridge, where thin layers of sandstone alternated with the chalk; and a little farther on, the hills were covered with red clay, and we reached Nebi Musat‡ at

\* The Mediterranean Sea bore S. 61° W. | Mount Ebal .. .. S. 48° E.  
Mount Gerizim .. .. S. 33° E. | Variation 10° W.

† Dr. McGowan, of the British hospital at Jerusalem, has registered the rain for some years, and found 108 inches the greatest quantity in any one year.

‡ A hard fawn-coloured limestone, shelly, and full of fragments of bone; also nodules and lumps in limestone.



2.05 P.M., which by aneroid was 2495 ft. below Jerusalem, and 329½ ft. below the level of the Mediterranean. The soil smelt very strong of sulphur, the rocks dipped to the N.W., and I got specimens of limestone of an oolitic structure, also of a seam of bituminous and calcareous limestone, with peetens about 6 in. thick, of which bowls, seals, &c. are made. Thermometer was 89° Fahr. in the tent at 3 P.M.

*October 27.*—I left Nebi Musa with a single Arab at 4 A.M. to ride to the Dead Sea—said to be three hours distant. I reached the shore in an hour and a half. We rode through steep winding defiles: the ground sounded harshly under the horse's feet. Thermometer in air 70°, in the Dead Sea 82°, and fell to 64° Fahr. in drying. I waded in to a depth of 4 ft., where I filled a bottle with the water, and got a specimen of clay and bituminous stone; this was near the island as marked on the maps, but which I found to be a promontory with a few dead shrubs encrusted with salt upon it. The water was beautifully clear and calm. The line of drift-wood was 4 ft. above the present level of the sea; rounded pebbles of different kinds formed the beach; but I could not find either sulphur, nitre, or bitumen. By aneroid the sea was 1313½ ft. below the Mediterranean, and 3450½ ft. below Jerusalem. My Arab guide did not like me to remain long, as seven Arabs of another tribe came from the Jordan to see who we were. We left the shore of the Dead Sea at 6.30 A.M.: crossed the first ridge at 6.50; passed over what I thought might have been the original level of the old plain at 7.15, and 532½ ft. above the Dead Sea. At 7.30 we reached the top of the mountain, 1025 ft. above the Dead Sea, and we got back to Nebi Musa at 7.50, having been only 1.20 hour in returning. I left Nebi Musa at 9.30 A.M., and arrived at Jerusalem at 2.45 P.M., so that a person might easily go in 6½ hours from Jerusalem to the Dead Sea by this route. In the evening I arranged with Abú Daouk, that the number of the guard was not to exceed 12 men, at 10 piastres each per diem, and 20 piastres per diem for himself and horse.

*October 28, Sunday.*—Adam Bek, deputy Pasha, called on me: he was much interested with the aneroid, and anxious for a railroad to be made to Jerusalem.

*October 29.*—I left Jerusalem at 10.30 A.M., and rode by way of Bethlehem to Urtas, where Elijah Mashallam joined me. This valley is very fertile, being watered by the Pools of Solomon, which we passed at 1.30 P.M. By aneroid the aqueduct was 81 ft. above the bottom of the Pool of Hezekiah in Jerusalem. The ground kept rising until we reached Khan Cull at 5.15 P.M. We arrived at Hebron at 6.30 P.M., where we encamped. Wolves, jackals, boars, foxes, badgers, and porcupines abounded. A great deal of land is cultivated, and large vineyards were near the town.

*October 30.*—We had to remain all day to enable the muleteers

to get barley, water, and other articles for the journey. I went to see a tree called Abraham Oak, 23 ft. in circumference, near which I got two fossil shells. We afterwards rode to visit the ruins of Rama, on the plain of Mamre, and passed by the e. side of Hebron, where the limestone was nearly level, dipping slightly to the s.e. At 2 p.m. we passed by Ain-es-Lin, where I got fossil shells much crushed. The ruins at Rama measured 214 ft. from e. to w., by 165 ft. n. to s.; the walls were 5 ft. 10 in. thick, of shelly limestone.

*October 31.*—We left Hebron at 8.15 a.m. and rode nearly S., and at 9.45 passed the ruins of Ziph, about 1 m. off on our left. At 10.30 I visited the ruins of Em Sirkan, which must have been a large city: soon after, going due s., we passed other ruins, and came to Birket-el-Kurmel at 12, where there is a ruined tower, extensive ruins, and a large pool filled up with dirt: but a good spring of water in a cave on the n. side of the pool. From El Kurmel we travelled e., and at 1 p.m. came to a well at Tawaná, then crossed a ridge, and descended into a plain on a s.e. course, with a dry water-course and rocky sides; at 1.45 p.m. we crossed another ridge, and at 2 p.m. reached the encampment of the Djahalins, consisting of about 70 long tents made of goats' hair. Our baggage did not come up until 4 p.m., so we had to camp there. There were not any trees or shrubs on the route, after having left Hebron; the rocks of limestone continued unchanged.

*November 1.*—We left the camp of the Djahalins at Tawan at 9.15 a.m., and rode s. till 10.15, when we came to a well and watered our horses; we left at 11 a.m., and rode on a s.e. course till 12.25, when we came to the valley of Drippings (Wadi Mahras of Lynch), where chalk showed in several places overlaid by limestone. At 1.40 p.m. we came to a ridge where I got a view of the Dead Sea; at 2.10 p.m. we reached Ermelé, where I had a good view of the s. end of El Lisan, or the Peninsula, and the s. bay of the Dead Sea; we then descended a steep bank to a dry brook, then rose again and crossed a ridge at 3 p.m. with a high mountain (Masada) on our left. The country was quite barren the whole way, and very hot. At 3.23 we came to a plain, where the sheikh wanted to camp, but I thought it too early in the day, and pushed on until 4.30, when we camped at the Bed of the Dervish. Picked up a small piece of lava.

*November 2.*—We left the camp at 8.10 a.m. and rode on a s.e. course; at 9 a.m. we passed a large Talkha tree, and then rode through a defile, called the "Bazár Pass;" the rock looked like cinders of sulphur. At 9.40 we passed what appeared to be an old crater: the rocks dipped n., s.w., and s.e. At 11 a.m. we came to the top of the ridge Neheb. We now descended rapidly by a winding path, and at 11.45 passed a ruined



tower called El Zuereh, and at 12:35 pitched our tents on the plain of Usdum. The temperature in the tent was  $90^{\circ}$ . The horses had to go to Em Berghek for water, and did not return until 5 P.M., so we were not able to ride anywhere. I walked down to the shore of the Dead Sea, and got a bottle of the water, temperature  $83^{\circ}$ ; it was not so clear as at the north end, but was more saturated with brine. Crystallized salt extended 40 yards in width from the water's edge, and the line of drift-wood was 70 yards distant. I picked up crystallized spar and saw a flock of about 30 black and white birds, swimming in a line and diving out in the water. I found no shells upon the shore. We passed a hole where a camel had fallen through the encrusted sand, which was about 60 ft. above the present level of the sea. Many parts sounded hollow, as if there were subterranean watercourses.

*November 3.*—We rode to the Cave of Usdum, which I found was about midway of the length of the mountain, and on the east or side next to the sea. Rock salt was visible all the way along in the mountain side with limestone overlying it, with a general dip of  $45^{\circ}$  w. The rocks of the cave were composed of large, loose, broken masses, so we could not penetrate far; but I was told by the Arabs as well as the tent men, who had been along with De Sauley, that we had penetrated farther than other travelers, as no one previously had observed the long stalactites of salt which I discovered; and yet by measurement I had not gone over 200 ft. in a direct line into the cave. I also observed that there was a current of air passing into the cave and ascending towards the roof where the stalactites were, so I had no doubt but there was a communication with the top of the mountain at that place. I got spar above the rock salt, but could not find any nitre. Marshy ground at the south end of the Dead Sea had a red appearance, but the mud was too soft for any person to walk upon it. On returning to our camp, I saw a flock of nearly 100 black wild fowl, diving and flapping their wings in the Dead Sea, and I could not but think that both the flocks had been feeding at the time.

*November 4, Sunday.*—We attempted to ascend Mount Usdum from the west side, and went up a water-course to a height of 270 ft. by the aneroid, when I found the side so steep and full of fissures, that I did not like to proceed for fear of breaking my instruments; there were pinnacles of salt in every direction. The highest point must be 400 ft. above the Dead Sea. At 10 A.M. we left Usdum and rode along the western shore; I saw many dead trees standing in the Dead Sea for some distance from the shore in the bay. At 10:45 we came to a brine spring, temperature  $90^{\circ}$ , about 100 yards distant and 30 ft. above the level of the sea. It spread over some extent of ground where the kali plant grew freely. At the drift line and a few yards from the Dead Sea, to which there was a free communication by the

running stream, I caught several little fish\* from half an inch to one and a quarter inch in length; I therefore think there must be fish in the sea from whose spawn these little ones had been produced. The same kind of fish, some three inches long, were afterwards seen in the "Spring of the Morass" near the north end of the sea, but none could be found in any of the brooks running into the sea upon the west or south shore. A duck came flying across the sea to this spot just as we left it, most likely to feed there. A number of camels came to Usdum for salt; the Arabs get 60 piastres or 10s. per load of 500 lbs. at Jerusalem, the purchaser paying the Turkish Government a duty of 15 piastres per load additional. A camel could not make more than 24 trips in a year under favourable circumstances.

*November 5.*—We left Usdum at 8.45 A.M., passed the Cave at 10 A.M., and rode south until we came to the end of Usdum; we then crossed at 11.10 a brook, dried up in places, from which the Arabs, at present, collect their salt. Thence we rode s.e. across a marshy plain without a sign of vegetation. The road is not passable in wet weather. I passed 11 dry brooks and stopped at 12.15, near the rank growth of reeds on the eastern side of the plain, until the baggage-mules came up. A very white range of mountains continued s. from Usdum, and a countless number of conical hills covered the plain to the s. I saw the mountain of Petra in the distance, but could not distinguish any opening in that direction. Just as we were passing through the belt of reeds we were attacked by a band of Bedouins (45 of the Beni Orkbé tribe) armed with spears and pistols: fortunately they could not use the former among the tall reeds, which gave time for a parley. One of my guards belonged to the Tamari tribe, friendly with the Beni Orkbé. They recognised each other, and he told them that my party was under the protection of his tribe, the Tamari; they therefore agreed to let us pass without molestation. They had threatened at first to shoot Abû Daouk, as he was at war with them, and had stolen a number of their camels; one had thrown his spear at me, which luckily fell short; another rode up and took hold of the muzzle of my gun, which I then turned towards his body; upon which he left hold of it and rode off. It thus turned out that we were fortunate in having engaged the Tamari. The Beni Orkbé dismounted and piled their spears while we rode past them. We gave some of them a little tobacco. This encounter detained us until 1.30 P.M., when we passed along through a variety of trees and shrubs and cultivated patches of ground. At 2.30 P.M. we crossed three small brooks of swiftly running water not far from each other, called by the Arabs "Ain

\* These fish have been sent, through the British Museum, to Sir John Richardson, who has named them *Lebras*, or *Cyprinodon Hammonia*, and who has promised to describe them. Cuvier describes similar fish as being found in the Red Sea.



es Ashkha," and at 3 p.m. came to a large encampment of the Ghoranhi: the plain being called Ghor. A sirocco at night first filled our tent with sand, and afterwards blew it down.

*November 6.*—A calm morning. A ruined tower called Kasar-Aswad was on the mountain side, opposite to the tents. We started at 10 a.m. and rode through a very large plantation of maize, and travelled by the lower or shore road. After passing the cultivated lands near the river Ashkha, we crossed a stagnant brook, and rode along the side of a bay with very little saline incrustation; we then passed large boulders of conglomerate, afterwards boulders of red sandstone, of which some had black veins and others red or yellow veins running through them. At noon we reached the north side of the bay, where a point of land juts out into the sea, about 2 m. across; it was covered with mimosa and other trees near the base of the mountains, while the other parts were covered by bushes or rank vegetation. We then rode along another bay close to the water's edge, which washes the base of the mountain. The rocks here showed a horizontal stratification in a line parallel to the shore, having a dip to the east. The highest ridge had a red tinge, the next ridge was of a dark brown colour, while at their base were one or two appearances of chalk. A great many places appeared like extinct craters, and the whole line of mountains was full of rents and sharp points. At 1 p.m. we rode across a second point with a number of mimosa trees on it, and near them some ruins. I noticed two stones which had been hewn and dressed; farther on were numerous lines of foundations as of an extensive town. The tomb of the Sheikh Salakh, or "Peace," was also on the point. He is the patron saint of the Bedouins, who still sacrifice at his tomb before going on their predatory excursions. At 1:20 p.m. we rode through loose rocky ground, which was furrowed by the winter rains. Two brooks were still running. We then rode round another bay, and at 3 p.m. we came to the south side of the peninsula, El Lisan, or the "Tongue." This was the spot where Ibrahim Pasha fought the four tribes of Bedouins, viz.: Beni Orkbé, Beni Suchké, Beni Hamidé, and Kerak. Ibrahim is said to have lost 20,000 men in the battle and among the mountain passes, and the Bedouins to have lost only 7,000 men. He did not subdue them. We next passed the Pool or Birket el Ketmé, which measured 82 ft. square and 11 ft. deep to the mud. It had been plastered inside, and the first coat had been scored for the better adhesion of the second. Traces of an aqueduct and other buildings still remained: this was, no doubt, the site of an ancient city, but not so large as the one near Sheikh Salakh's tomb. I picked up a number of shells of *Turritella* in the pool. I then rode east across the peninsula; the soil appeared sulphurous, and was full of small hillocks and dry water-courses. At 4:15 p.m. we came to a small swift running

stream, "Wadi el Deraah," flowing down into the bay formed by El Lisan. On our right on the main land, we observed ruins which are called Khirbé tawarken-el Suker, or ruins of the sugar mills, which would indicate that sugar-canes had been formerly grown there. At 4.30 p.m. we came to another settlement of the Ghoranhi, who were more numerous and uncivilized than those at the first Ghor. Few of them, even men, had on more clothing than a strong cotton shirt. They mentioned that a shock of an earthquake had been felt three days before; it was also felt at Jerusalem.

*November 7.*—The Beni Orkbé returned with thirty-five camels, which they had stolen from a village on the west side of Usdum, and coolly said that they had shot two men and a woman of the Assaymis tribe, who had resisted them. They had not fed or rested their horses since they parted from us at the Ghor, and now killed a camel, upon which they feasted; and our Arabs gladly accepted their invitation to join them. At 10.30 a.m. I left the camp with Elijah Mashallam, the Ghor Sheikh, and one mounted Arab, to explore the Peninsula. We passed a mound, which we were told was an old grave; saw the tracks of gazelles on the sand; and at 11.15 we reached the s.w. corner of the Cove. The stratification of the hills of El Lisan was nearly horizontal, with a slight dip to the east. At noon we found a great many dead locusts lying on the beach; I also got specimens of spar and thin shales dipping s.e. about 5°, which continued nearly the whole way to the north point of El Lisan, which we reached at 12.40, and where I took the bearings of several places; \* filled a bottle with water from the Dead Sea, which was, at least, half a mile from the foot of the hill. There was not any break through the range of hills, as indicated by the map. I got a few specimens of sulphur and some botryoidal limestone. At 1.20 p.m. we left and rode along on the west side of the Peninsula; a ridge of rocks and breakers showed for some distance out in the sea from the north end, until we came opposite to Sebbeh, where they again united with the shore. There I saw three ducks settle in the water and swim along, as if feeding at the edge of the surf. At 2.45 p.m. I saw seven other ducks sitting on the edge of the shore. We tried but could not get within shot of either lot, which appeared to be smaller than those we had previously seen. At 3 p.m. our horses scrambled up the south end of the sulphur hills, and we reached the table-land at 3.30, where the aneroid made the height about 230 ft. above the Dead Sea; the banks of the ravines were nearly perpendicular, and at the base of them I observed the ends of trees sticking out as if it had formerly been a line of drift-wood. Two large circular

\* Mouth of river Arnon .. N. 50° E.  
 " Callirhoe .. S. 20° E.  
 Engedi Point .. .. S. 12° W.

Frank Mountain .. .. N. 20° W.  
 Birket el Khalil .. .. N. 54° W.



depressions were observable on the table-land, and I noticed that there was a hole at the root of almost every shrub. The whole way was full of holes and cracks, down which rain would run, and the surface appeared covered with a sulphurous crust, beneath which the soil was of a soft chalky colour, and of a loose sandy nature. The ridge was about 2 m. wide, but is wearing away annually on both sides. We returned to the camp at 5 P.M. I only got two or three small bits of asphalt, and not any nitre: jackals were howling all night. The Sheikh of the Beni Orkbé wanted to escort us to Kerak and the river Arnon; and when he found that we were not going there he demanded backshish, and Abú Daouk gave him 100 piastres to prevent him from bringing down the other tribes upon us; we also promised to return at once to the west side of the Dead Sea.

*November 8.*—Thermometer 72° at 6.45 A.M. Some one had stolen my hammer as it hung on my saddle, and I complained to the Sheikh; but it was too great a prize to be given up again. We left the Ghor camp at 9.15 A.M. and rode to the ruins of the Sugar Mills, or Kherbet tawarken-el Suker, and of which I took the measurement. A fine stream was flowing alongside; the ruins lay within the range of the mountains and cover a large area, so that it must have been the site of a very populous city. We left at 11 A.M., having sent the baggage on in advance. At 11.40 we passed the pool, and at 12.25 came to the bay at the south side of El Lisan; we then crossed a point of land, and at 12.42 came to a second bay, where we rode close to the water's edge. At 1.30 P.M. we crossed two brooks of good running water, with oleanders blooming on their banks. At 1.40 P.M. we came to the Sheikh's tomb and the ruined tower, where a party of twelve Bedouins had posted themselves. They declared war against Abú Daouk, and threatened to fire; he talked boldly to them, although there were only five of us with him at the time, and we passed on without molestation. We got back to the first Ghor encampment at 3.35 P.M. I picked up samples of rock, which had apparently rolled down from the mountains of Moab.

*November 9.*—Up at 3 A.M. packing; thermometer 60° at 6 A.M. A very small grey-breasted honey-bird flew into the tent. We started from the Ghor at 8.10 A.M. I got some flowers and seeds from the osher-trees; also some black locusts, with yellow spots (*Petasia*), which were resting upon them. We passed the three streams at 8.36 A.M., and rode through the reeds, where we had been attacked by the Bedouins, at 9.24 A.M. All were glad to get out into the open plain, which we rode across. At 11.30 A.M. I went into a cave of Usdum, where were immense blocks of rock salt, but I could not find any nitre. Soon after we passed the principal cave, and reached the north point of Usdum at 12.55. The sea had very sensibly receded from the shore since we were there, and

I should think had lowered a foot in perpendicular height. Arabs were collecting salt from the beach. We reached Em Berhek at 2:35 p.m., where many rows of large and heaped stones showed the remains of an extensive city. There were two pools: one measured  $33 \times 54$ ,  $6 \times 8$  ft. deep, and had five steps at the north corner; the second pool measured  $38.3 \times 39$ ,  $9 \times 8.6$  deep. The latter did not appear to have been square. There were the remains of a fort on the north or opposite side of the ravine. The brook wound through the rocks, and about a quarter of a mile inland there was a fall of 10 or 12 ft., from which point there had formerly been an aqueduct leading to the pools. Here I found a crab\* and some fresh-water shells.† It thundered and kept very hot at night, being  $83^{\circ}$  in the tent at 10:15 p.m.

*November 10.*—I took the measurement of the ruined fort. Abū Daouk told me that when a boy he had crossed over to El Lisan from this point on a camel. We left at 10:15 a.m., and very soon afterwards had to leave the shore, as the mountains came directly into the sea, and there was no beach to ride along; we had to travel along a very bad path, about 200 ft. above the level of the sea. At 11:30 we passed over a hill, where the rocks dipped s.w. about  $30^{\circ}$ . We then descended on to an extensive plain, with some mimosa trees growing on it, which is marked on the map as the point of the occasional ford. At 11:48 a.m. we passed the dry Wadi-Em-Dūn, or Wild Goats, which must sometimes be a torrent, from the size of the rolled stones in it. At 2:23 p.m. we were parallel with the ruins of the Sugar Mills, among masses of broken rocks, and some horizontal strata of the same kind of sulphurous limestone as on El Lisan, which spread over an immense area, full of fissures with steep sides. I should imagine that they had been made by earthquakes, and afterwards the rain had carried down the loose soil from their sides: some hills appeared like round towers. We rode between them and the mountains, the sides of which were nearly perpendicular, and their summits some 1000 ft. above us. At 2:40 p.m. we came to Wadi Sebbeh, where there were extensive ruins on both sides of the Wadi, with indications of pools on its northern bank. The remains of walls, with towers at certain distances running parallel to the mountain, were easily traced;‡ also the walls of buildings, with square sides, spreading over the plain. I observed that the convulsions of nature had taken place just along the line of the west wall, which remained on the upper level, while all inside of the supposed town had been sunk down to a lower level. At 3:15 p.m. we camped at the foot of the pathway leading up to Masada. Our camp, by aneroid, was 563 ft. above the Dead Sea; thermometer  $80^{\circ}$  at 5:30 p.m. The horses were watered at a spring about a mile to the north.

\* Thelphusia.

† Melanopsis, Buccinum.

‡ Circumvallation of Silva according to Josephus.



*November 11, Sunday.*—I walked part of the way up the mountain, passed a cave\* in the limestone rock, and ascended to 429 ft. above the camp, when I found the path so narrow, with loose stones and precipitous sides, that I returned.

*November 12.*—We left Sebbeh at 8 A.M.; the air had a sulphurous smell. We rode along what appeared to be an old Roman road, the stones being cleared for about 20 ft. in width, nearly in a straight course. At 8:30 A.M. we came to a coarse sandstone, in thin layers, dipping S.E. about  $10^{\circ}$ ; the stratification of the mountains appeared to be nearly horizontal. At 8:45 we came to the Wadi of Drippings, the outlet of the brook which we crossed from Hebron, and it took us 12 minutes to ride across the Wadi. At 9:12 we passed an Arab encampment, where the Sheikh and most of his men had spent Sunday. It bore due west of the north end of El Lisan. At 10:26 we passed the Wadi el Khubera, or the Spies. At 11:22 we rode down on to the plain Birket el Khalil, where tradition says that Abraham turned the salt into stone. Numerous small heaps of calcareous matter are scattered about, which look like salt-heaps at a distance. I observed a sulphurous smell coming from the sea at this point. At 12:15 we arrived at the base of Engedi, which we ascended as high as the spring, which was  $83^{\circ}$  of temperature, the air being  $86^{\circ}$ .† By aneroid, the spring was 710 ft. above the Dead Sea. Some Arabs of the Rashidy tribe were there, and talked very angrily of Abû Daouk taking strangers through their territory, until the Tamari told them that Elijah Mashallam was from Artas, when they became very civil; they said, "They and the heir of Artas were all of one tribe." There were the remains of a mill at the spring. The fruit of the osher-tree was much smaller than those gathered on the Ghor. A little attention to irrigation would make the whole of the hill-side very fruitful, and the remains of former terraces were clearly visible. We descended to our camp, which we reached at 2:10 P.M., situated by a spring of good water, and shaded by a belt of gigantic reeds. The Arabs bought a lamb, which they roasted in a hole of heated rocks. The cliff was about 200 ft. high on the north side of the stream, composed of coarse and fine limestone, flints, and sand. About midway up there were numerous caves, but quite inaccessible to us.

*November 13.*—We left Engedi at 8:45 A.M., and rode along upon the plain until 10 A.M., when we had to take a path over the mountain side, which was most execrable, being full of large boulders, through which there was great difficulty in getting the baggage-mules. We ascended 200 ft., then came down again on to the shore at 11 A.M. We passed by an apparent crater, called Khmeid, and began to ascend a second mountain at 11:45. We

\* Moghârat el Kebrit of Lynch.

† Kerkak bore s. 26 E. North point of El Lisan bore s. 28 E.

gained the summit of the first ridge at 12; the north end of El Lisan bore s. 23 e.; the height of ridge was 240 ft. above the Dead Sea. At 1-40 p.m. we reached the next ridge, 509 ft. up; the road was so bad that we had to unload the mules, and the men carried the baggage up a short distance; and they had to hold to the baggage and the mules' tails to check them in their descent. We did not appear to be half way up the mountains. We again reached the shore at 2-05 p.m., crossed a plain, and began to ascend, at 2-20 p.m., another mountain; at 3-30 p.m. we reached a table-land, 740 ft. above the Dead Sea, having crossed a succession of limestone-rocks, with steep banks on each side. We rode along this table-land north for a quarter of an hour, with a gradual fall towards the sea. The view was magnificent, and I could see Kerak tower very distinctly in the distance. We ascended another ridge for 14 minutes—height by aneroid 894 ft.—the main mountain still towering above us; we then made a rapid descent over sharp flints, with coarse conglomerate stones in the torrent's course, and perpendicular rocks on our right hand. We arrived at the Ghor at 4-25 p.m., where I saw a heap of ruins, which I thought might have been a well. We then rode through the reeds to the shore, where fresh water springs up close to the edge of the sea, and which I think must be covered by the sea when it rises from the winter rain. Temperature of air was 84°; Dead Sea 80°; spring 79°. The water from the latter tasted soft and sweet, while that of the sea was so saturated that I could see the brine floating in it. The mules did not arrive until 5 p.m., and were much fatigued with their day's work. The Tamari picked up a small piece of asphalt, of which we found very little during the whole of our journey.\*

*November 14.*—I left the camp at 7-35 a.m., and walked along the shore about half a mile, when I came to a salt-spring, coming out from under a large rock near the sea, and 3 ft. above its level, and the temperature 80°: I took a bottle of it. I then walked on to the chief springs of fresh water, half a mile farther; the temperature of them was 80°. I saw a number of small fish, "Lebras," from  $\frac{1}{4}$  an inch to 3 inches in length, of the same kind as previously caught; but we could only catch one of them, from the water being abundant, and not able to confine them in a small space. We also collected a number of black shells, "Melanopsis." We left the springs at 9-45 a.m.; they extend for a considerable distance along the shore, and must yield a great many thousand gallons of water every 24 hours. At 10-20 a.m. we passed a cave, high up in the rocks, directly opposite to the mouth of the Callirhoe springs, and from which water appears

* North end of El Lisan bore	s. 10 e.
Mouth of River Arnon	s. 40 e.
" " Callirhoe	N. 85 e.



sometimes to have flowed. At 11 A.M. we reached the dry bed of the brook "Kedron," and picked up "a small turreted shell;" at 11 20 we rode near to some ruins on the north side of the brook, but I did not go to them, as we had to ascend the mountain. At 11 45 we reached the pass in the first ridge, about 730 ft.; at 12 20 we came to the second pass, where one of the mules fell with my luggage, and all would have rolled down the cliff from a height of 1226 ft. if the Arab leading it had not kept firm hold of the halter, and got him unloaded. We reached the summit, 1340 ft., at 1 P.M., from whence I observed that there was a table-land or level plain, about the same height, on the opposite shore of the Dead Sea, extending from the Callirhoe springs to the north end of the sea. The sea was remarkably calm, and reflected the sky and mountains in a very wonderful manner. We now rode inland for some distance, and did not appear to be very far from the Frank mountain, bearing S.W. The rocks were chalk, with hard horizontal bands of limestone running through them. Mashallah picked up a flattened fossil-shell, like *turritella*. I observed that these mountain-tops were of the same white and sulphurous limestone as in the plain. If they were of the same geological age, and at one time level with the plain before the destruction of Sodom and Gomorrah, those cities would have been nearly of the same level as the Mediterranean. At 2 05 P.M. we came to a small conical hill, where we had a fine view of the valley of Ghomran and the surrounding hills. Abû Daouk wanted to camp there, but I would not consent, so we pushed on until we came to the cliff above the ruins of Ghomran; the height was 951 ft. above the sea. A good deal of bituminous limestone was lying about.

*November 15.*—I arranged for the baggage to go direct to Jericho, while Mashallah, the Sheikh, and four Arabs accompanied me to visit the ruins at the foot of the mountain: it was a very winding path and quite narrow in some places, so that a loaded mule could not have passed down. Abû Daouk boasted that he had once driven seventy camels up this pass on a very dark night, when closely pursued, and so eluded his pursuers, who thought to have found him encamped at Ain el Feshkah. We passed a small cave, whence hot air issued. We reached the ruins at 8 15, having descended 713 ft. I found the remains of an aqueduct, walls, pools, and some buildings: one pool measured 58 × 17 inside and 11 ft. deep; it had been plastered on large unhewn stones. A smaller pool measured 21 × 9 ft.; it was filled up with rubbish. The main wall was close to the side of the large pool on the sea-side, between which and the sea were a number of graves. One of them I had opened was 6 ft. long by 3 ft. wide, and 4 ft. 10 in. deep: it was built up on all four sides with rough stones and square corners; there were no osseous remains traceable. The ruins were 238 ft. above the Dead Sea, and the base of the hills, containing

the graves, about 100 ft. above the sea. From the state of the ruins and graves, I should think Ghomran must have been a much more modern town than the supposed Gomorrah of De Sauley. We left the seashore at 9.53 A.M. and rode across the plain to Jericho, and saw a good deal of bituminous limestone scattered about. We passed some dry watercourses, which had lately had water in them, and crossed some sulphurous chalk-hills; picked up some spar. The ground was full of holes, made by a species of mole, called "gerdy," which made it dangerous to ride fast. Flints were strewed over the plain. The stratification of the mountains on the west side dips gradually to the north, so that opposite to Jericho the same strata are down on the plain which were on the mountain tops at Ghomran. We arrived at the tent, which was pitched near the guardhouse at Jericho, at 2 P.M.; thermometer in tent 91°. A running stream passed close by. The village was a dirty, miserable-looking place, with stone walls, and branches of trees formed the roofs of the houses. A guard of fifty Turkish soldiers live in the tower to collect the taxes and protect travellers. Maize, wheat, indigo, and egg-plants thrive there; potatoes have also succeeded very well. Jericho, by aneroid, was 516 ft. above the Dead Sea. The thermometer fell to 62° at 6 P.M., and was at 60° at 10 P.M. I felt very cold, and could not get to sleep. Jackals made a continual howling during the night.

*November 16.*—I heard that there was war between two tribes of Bedouins on the eastern shore of the Jordan, which prevented intercourse with the people on that side. I observed that trees grew on the tops of the mountains of the E., which was not the case on the W. side of the Jordan and Dead Sea. We left Jericho for the Jordan at 9 A.M., and soon after observed the foundations of walls and heaps of ruins, but not such large stones as on the shore of the Dead Sea. We crossed a dry river bed; the plain had a gradual slope towards the Jordan, with shrubs in clumps. We reached the Jordan at 10.40 A.M.; by aneroid the "Pilgrim's bathing-place" was 104 feet above the Dead Sea. The waters flowed rapidly, but were very muddy; the temperature was 64°, that of the air being 80°. I collected three kinds of shells (one a bivalve); crabs\* were also seen in the river. Several poplars were growing on the bank, also willows and tamarisks. Palms I did not see, although the whole coast of the Dead Sea is strewed with them. The river was about 50 yards wide at that spot: I saw only one hawk and a kingfisher flying over its surface. At 11.30 A.M. we left the Jordan, and at 12 passed over about 20 yards of aqueduct; soon after we came to a stone well in the bed of the river, but it was only 6½ feet deep and full of stagnant water, being 250 feet above the Jordan. The banks of that river were so winding and thickly wooded that I could not take any bearings of

\* *Thelphusia*.



the surrounding country. We then visited the ruins of the church of St. John, bearing s. 48 e. from Jericho.\* At 2·10 p.m. we left the ruins, and a few minutes' riding took us across the bed of the first river; in three-quarters of an hour we crossed the bed of the Jericho river, and returned to our camp at 3·15 p.m.

*November 17.*—Up at 3·45 A.M.; thermometer 57°. We left Jericho at 6·50 A.M., just as the sun rose above the mountains of Moab. We rode through what must have been a fine garden in the bed of the river Araba, then passed under an aqueduct, of which I counted 11 arches, spanning the river, which appeared in good preservation; soon after we passed another aqueduct in ruins, only two arches remaining: then the sides of a third aqueduct were traceable nearer to the mountain: all of them had brought water from the river of Jericho to irrigate the plain towards the Dead Sea. We rode up on the s. side of the river Araba for some miles, the rocks being limestone. The road was in many places very winding and steep. At 9·23 A.M. we came to a pass, called the Khan Khatrudé, with a well, where the pilgrims, in general, rested; we then descended for a short time, and crossed at 9·40 the plain of the Robbers. At 10·30 we reached the point where the road joins from Nebi Musa; and at 11·25 A.M. we stopped to drink at the spring of the Apostles; temperature of water 71°. We passed through Bethany at 12·05, and arrived at Jerusalem at 12·50. The thermometer in my room was 60°. The baggage-mules did not arrive until three hours later.

*November 18 (Sunday).*—I had an attack of fever and ague in the afternoon, which I fear was caused by our camping on damp ground at Jericho.

*November 19.*—I was engaged settling the accounts of Fadlallah and the Tamari. Abû Daouk sent word that he was ill. Elijah Mashallam was also complaining of fever and ague from the cold: the change was so great and sudden, 60 instead of 90 degrees in 4 hours.

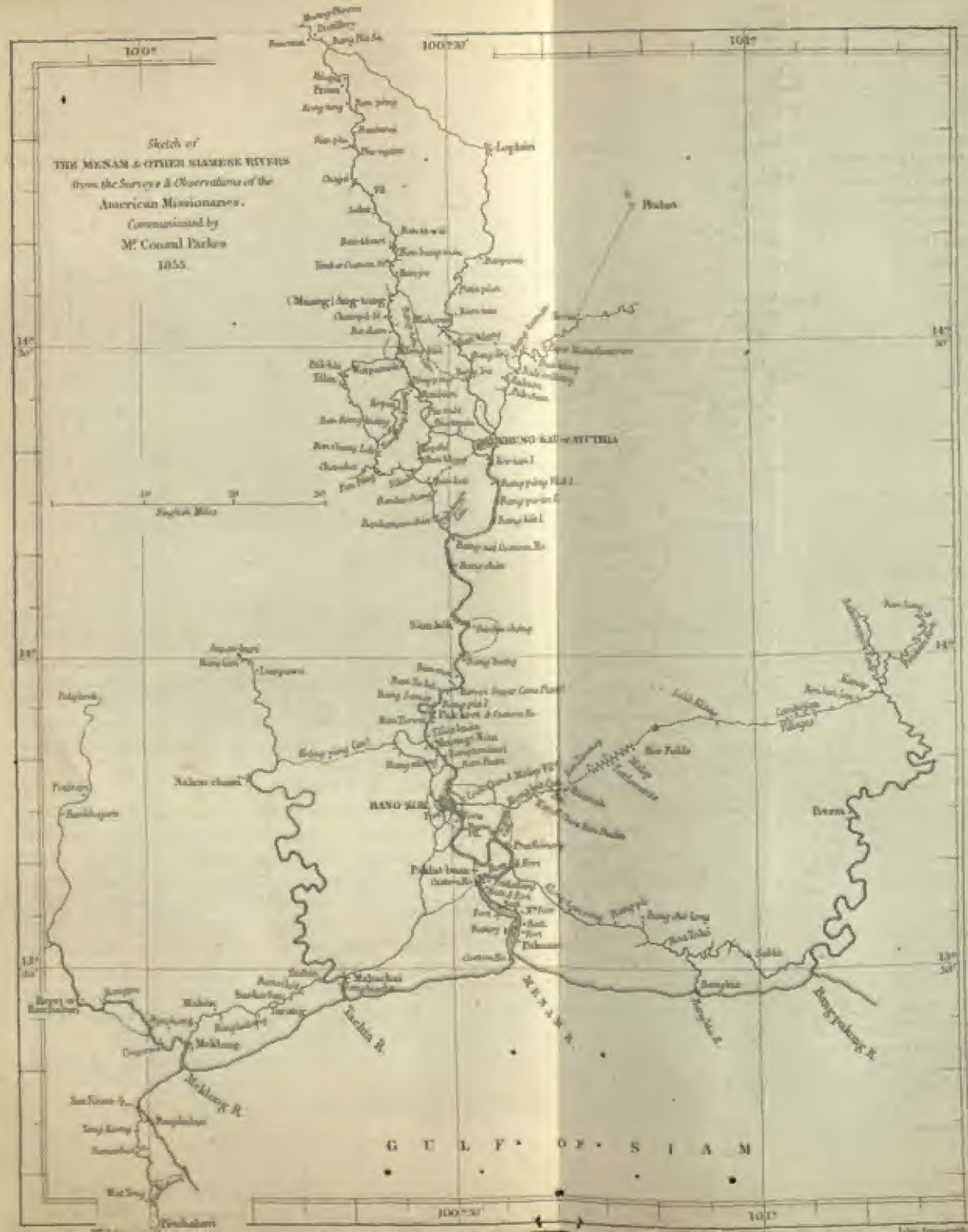
*November 20.*—I felt so ill that I was not able to go anywhere, and remained in Jerusalem until the 26th, when I left for Jaffa, to be in time for the steamer proceeding to Alexandria. I got to Ramleh at 6 p.m., and stopped at the convent all night.

*November 27.*—I left Ramleh at 5·35 A.M., and rode to Jaffa in two hours and twenty minutes, where I rested until 1 p.m., when I went on board the steamer, which left for Alexandria at 5 p.m.

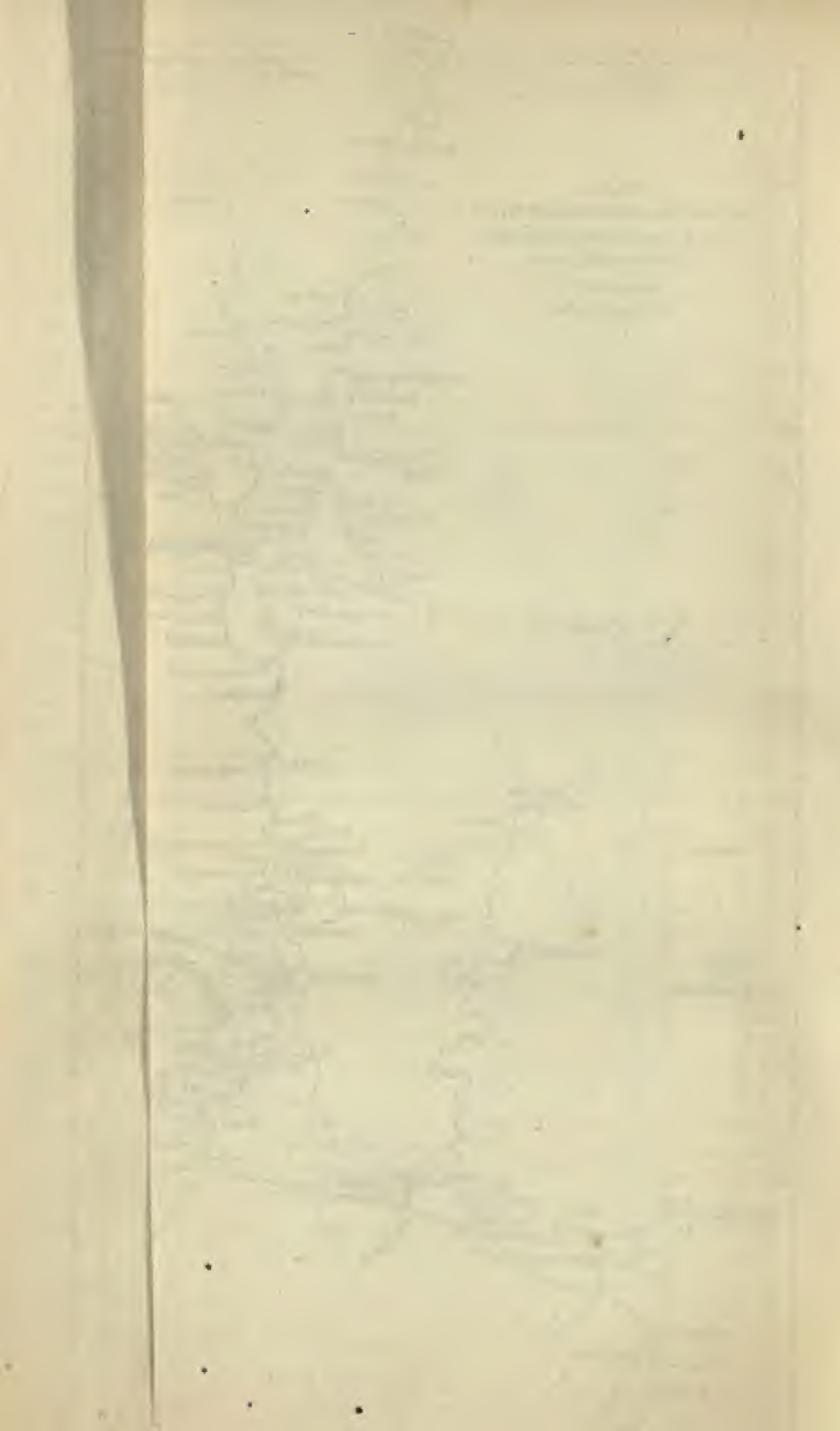
\* P.S. I beg to send in a section of levellings made by me in Palestine with the aneroid métallique.]

\* North end of Dead Sea bore s. 45 e.  
Ain el Feshakh, or Stride, s. 23 w.









VII.—*Geographical Notes on Siam, with a New Map of the Lower Part of the Menam River.* By HARRY PARKES, Esq., F.R.G.S., Her Britannic Majesty's Consul at Amoy.

*Read, December 10, 1855.*

THE treaty with Siam, lately concluded by Sir John Bowring, has brought that country into prominent notice, and added greatly to the interest that had been awakened by the remarkably liberal and enlightened characters of its two present sovereigns, and certain of their principal ministers. The opposite policy of jealous exclusiveness which had been pursued prior to the accession of the present sovereigns in 1851, had restricted foreign communication and prevented the expansion of European commerce, for which ample elements exist. Now, however, that the whole country has been freely thrown open to the enterprise of our merchants, it becomes deserving of our best attention; while its geography, which, in common with all the Hindu-Chinese, or ultra-Gangetic nations, remains very imperfectly known, requires special investigation.

The first important endeavour, made on our part, to improve or open up commercial relations with Siam, was confided to that veteran Orientalist and political agent, Mr. John Crawford, who proceeded there on a mission in 1822, and succeeded amid great difficulties in laying a foundation for friendly intercourse, and in acquiring such a knowledge of the genius and manners of the nation, and the resources of the country, as tended greatly to facilitate subsequent negotiations. Captain (afterwards Colonel) Henry Burney followed in 1826, and concluded the treaty upon which our political and commercial relations with Siam have hitherto been based. The arrival of Roman Catholic missionaries in the country, has been traced up to the time of St. Francis Xavier,\* but no modern work has proceeded from their pen until last year, when Monseigneur Pallegoix, the present vicar-apostolic, on the occasion of his return to France, published a description of Siam, giving the results of his experience acquired during a residence of 24 years in the country, which must be regarded at the present moment as valuable and opportune. Several English merchants and American Protestant missionaries have also lived in Siam for the same length of time; but either from fear of a jealous government, or other motives, we have, with the exception of a description of the transitory visit of Malcolm, no published record of their observations and researches. That they have been industrious explorers, however, I had an opportunity of learning

\* M. Beryth, principal vicar apostolic, arrived at Yuthia with six missionaries in 1662.



during my recent visit to Siam with Sir John Bowring; and indeed the principal object of this brief paper is to bring under the notice of the Society the contributions which they have made to the geography of Siam, as they are embodied in the map now submitted, and which represents the lower portion of the Menam and other Siamese rivers. Considering, however, how few of us are familiar with the extent, or the different states of which this kingdom is composed, I trust I may be allowed to preface the subject by glancing, in the first place, at the principal civil divisions of Siam.

The Siamese dominions may be said to extend from the 5th to the 21st degree of north latitude, or to upwards of sixteen degrees, and from the 98th to the 105th degree of east longitude, or about seven degrees. Of the longitude we may speak with more certainty than the latitude, for we still remain without the means of defining the northern boundary of Siam with any certainty. Most probably Siam Proper reaches to the 18th degree of north latitude, whilst its principal tributary, the Laos kingdom of Changmai, extends northwards as far as the 21st degree. These positions indeed have been adopted in the original MS. map constructed recently by the Prince Krom Hluang Wongsa, an uncle of the present King, and one of the highest and most distinguished state functionaries. He constructed it last year when employed on the frontier as Commander-in-Chief of the Siamese army, then engaged in a war with Chiangtoong, a tributary Birman state; and we may certainly acquit him of being disposed to disparage his own country, by making it appear smaller than it really is. Bishop Pallegoix, however, defines Siam as extending from the 4th to the 22nd degrees of north latitude, or two degrees in excess both of the above calculation and the careful estimate by Crawfurd. The kingdom of Siam comprises—

1. Siam Proper, occupying the centre.
2. Tributary Malayan States, on the south.
3. Conquered territory of Camboja and Korat, on the east.
4. Tributary Lao States, on the north and north-east.

Siam Proper is divided into 41 provinces, each of them governed by a phya or mandarin of the first class, who is the King's viceroy, and is assisted in the administration by two deputies.

2 The Malayan States are Patani, Tringanu, Kalántan, and Quedah. The tribute or acknowledgment of fealty paid by these states, especially in the case of the last three, viz. Tringanu, Kalántan, and Quedah, the populations of which consist for the most part of Malays, is little else than the triennial presentation at Bangkok of a gold and silver flower, and, in effect, is often as nominal as the same mark of dependence observed on the part of Siam itself towards China. They are indeed bound to contribute

men, money, and provisions, when Siam is at war, but it appears that they seldom keep this engagement, unless Siam is in a condition to enforce it. In the case of Patani the subjection is more complete, on account of its population being, to a large extent, Siamese.

Camboja, now nearly divided between Siam and Cochin China, was, three or four centuries ago, more powerful than either of them, and at one time had the rule of many of the Lao States, and even of Siam itself. Attacked and harassed by the Anamese, that is, the Cochin Chinese and Tonquinese united, on one hand, and the Siamese on the other, large portions of its dominions have, from time to time, been seized and appropriated by these States, until but a small remnant of about two degrees of longitude and three or four of latitude, with a single seaport, Kampot, and perhaps half a million of subjects, are all that remain to the present impoverished monarch. The son of the Cambojan King is kept by the Siamese as a hostage at Bangkok, for the friendly conduct of his father; while the Cochin Chinese possess even a more material pledge in the exclusive navigation of the great river Mekon, which they have closed against the Cambojans.

Korat, previous to the Cambojan annexation, was the frontier state of Siam to the east, and considered, therefore, a highly important post. The Prince who rules it has the seat of his government in a strongly walled town, which can only be approached by a dense and dangerous jungle, known among the natives by the name of Dong Phya Fai (the forest of the king of fire). The journey from Bangkok to this place has lately been performed by Dr. S. R. House, an enterprising American missionary, long resident in Siam.

The Lao States present a most interesting people to our consideration, whether viewed in regard to their honest character and primitive manners, or as being the parent stock of the Siamese nation, and it has been even said of the Anamese also. I cannot say whether the designation "Lao," by which they are known among the Chinese, and which, in the language of the latter, signifies "ancient," or "the ancients," was given to them in allusion to their supposed antiquity. By the Burmese they are called Shans, but by themselves Tai, or Tai Yai, the elder Tai, in contradistinction to Tai Noi, the lesser, or the younger Tai, by which the Siamese have, until very lately, been commonly known, though they now endeavour to reject this designation. The fact, however, is sufficiently proved both by language and reliable historical documents. The philological studies of the American missionaries show, that while the Burman and Peguan languages are entirely diverse, except in the form of their alphabetic characters—the Siamese and the Laos, on the other hand, are substantially the



same, except in their written letters. The Laos have evidently borrowed their letters from their neighbours in Burmah, and the Siamese alphabet is as evidently a modification, or perhaps a simplification, of the religious character of Kamboja. As a distinct language the Siamese could not have existed for more than four or five centuries at the utmost, and it would thus appear that when the Siamese first separated from their northern progenitors, the Laos, they became a tributary province of Kamboja, and long continued to be governed, to a greater or less extent, by Kambojan officers. This circumstance will account for the fact of the court language being so largely imbued with Kambojan terms, and their sacred books, to this day, being wholly written in the Kambojan character.

In immediate connexion with Siam, it will be sufficient to notice two of the Laos tribes, severally named by the Siamese Lao Pungkao and Lao Pungdum, or White-bellied and Black-bellied Laos. The practice of tattooing, which is not observed by the former, but is universal among the latter, who cover their bodies with figures of tigers, dragons, and every description of beast or monster, is the cause of their being thus designated. The Black-bellied Laos comprise the states of Chiangmai, Laphun, Lakhon, Muang Phe, and Muang Nan; of which the first, Chiangmai, is the chief, and appears to maintain some sort of rule or jurisdiction over the others. Bishop Pallegoix describes the principal city as being surrounded by double ditches and double walls, enclosing a space of 1000 fathoms by 900, and having a population, including the suburbs, of 50,000 souls. The Menam runs at the foot of the walls, and the distance from Chiangmai to Bangkok, following that river's course, can be performed in fifteen days, though, according to the Siamese habit of travelling, a month is more generally occupied on the journey.

The White-bellied Laos, dependent on Siam, are in the state of Muang Lom, in about lat.  $17^{\circ}$ , at the head of one of the tributaries of the Menam, and in Luang Prabang, about a degree to the N.E., on the bank of the great Mekong. The former is unimportant in point of extent or population, but the latter is of considerable consequence in both these respects. Bishop Pallegoix assigns to its capital the large population of 80,000 souls. It was conquered by the Siamese, and incorporated in their dominions as recently as 1828, when the king and many of his subjects were brought captive to Bangkok, and the former suffered death in the most inhuman manner.

For the map of the lower portion of the Menam and other Siamese rivers, I am indebted to the kindness of Dr. S. R. House, who allowed me to inspect the surveys and observations drawn up during the course of the repeated excursions which he and

his missionary colleagues of the United States are in the habit of taking into the interior. These journeys are always made in boats, the rivers and canals being the common, and, in most parts of the country, the only highways which Siam possesses. The method resorted to was, to note the course by compass at every turn of the river or canal they traversed. The length of time taken to pass over each course was then marked by the watch, and the rate of going ascertained by a sounding lead, used as a log-line, and thrown overboard whenever it was judged that the rate was changed. The observations thus taken were most numerous and minute. Much of the ground has been gone over more than once by different persons; their respective observations have been compared, and, in working them into the map, the results have been found to agree with very tolerable accuracy with those few positions which have been laid down by astronomical observations.\*

It is probable that this map contains all the authenticated geographical information we possess on that most important part of the Siamese dominions, the great valley of the Menam. It is constructed on the scale of two miles to an inch, and embraces very nearly two degrees of latitude and longitude, the town of Petchaburi being (by observation) in lat.  $13^{\circ} 5'$ , and Lopburi in lat.  $14^{\circ} 48'$ , while the point at which the survey terminates is 12 or 14 m. to the north of the latter town. Allowing for the windings of the main stream and its tributaries, the map delineates with considerable accuracy nearly 400 m. of this comparatively unknown river. It defines also, for a considerable distance in each case, the courses of the other three rivers that water this great valley, viz., the Bangpakong, for about 100 m.; the Tachin, for 70 m.; and the Meklong, for about 60 m. Several of the principal canals, which spread like a net-work over the country, and connect these rivers at many points, are also delineated. These are far too numerous to be given in detail; and during the rains, when the whole country is inundated, it is not even necessary for the boats to confine themselves to the canals, as they can be pulled or poled across the country in almost every direction.

The travels of Bishop Pallegoix have extended farther into the interior than those of the American missionaries; but he does not inform us whether he has embodied his experience in a survey, nor does he, as far as I am informed, define by latitude and longitude the position of any of the places which he visited. From his narrative, it appears that he penetrated above the town of Phitsalok to the borders of the Lao country, or about 300 m. to the north and north-east of Muang Phrom, the farthest point to which this

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\* A tracing of the original was presented to the Society by the Author of this Paper.



survey extends. He explored the Meklong to Pakphrek, believed to be about 120 m. from its mouth; he ascended the Tachin as far as Sapanburi, which he considers to be 180 m. from the sea, though the position on his map could not make the distance greater than that of Pakphrek. On the right branch of the Menam he reached Pakprian, about 30 m. beyond the point where this survey terminates, and he travelled on the Bangpakong, as far as Khorayok, which he states to be two days' journey, or perhaps little less than 100 m. beyond Petriu. The fertile or cultivated districts, however, appear, in few cases, to extend far beyond the limits of this survey; and within this space, rich crops of rice, indigo, maize, fruits, and vegetables, in great variety, with sugar, cotton, pepper, and other spices, gums, &c., render ample returns to the industry of the people, wherever it has been applied. On the other hand, the wildest and most complete desolation appears to reign throughout the vaster and more remote tracts, which, according to Bishop Pallegoix, are tenanted almost solely by beasts of prey.

This survey supplies the positions of the two principal cities of the country—Bangkok, the present metropolis, and Ayuthia, the ancient capital. It also embraces 14 other towns, the population of which varies from 2000 to 10,000, and 150 villages, numbering sometimes 20 or 30, at others 200 or 300 inhabitants. The houses of the mass of the people are constructed of teak-wood and atap, very neatly put together, and sometimes attaining even lofty dimensions; but the temples and their attendant pagodas form the chief architectural feature of towns and villages, and their number sufficiently attests the deep attachment of the people to Buddhism, the universal religion of the land. The sites of 305 of these temples—most of which are of large size, supporting from 50 to 100 priests in each—are marked in the survey; but this number would be considerably more than doubled if it included the sanctuaries of the towns, as more than 100 are to be found in Bangkok alone.

In the old accounts of Siam, given by the early Portuguese and French writers, two capitals are constantly spoken of, and severally called "Lonvo" and "Siam." The first is a corruption of the Siamese name Lopburi, and the latter is Yuthia, or Ayuttaya,\* the foreigners of those days having employed the name of the nation to designate what was then its principal metropolis. The Burmese wars of 1760 and 1766, and the removal of the seat of government from Bangkok to Phiatak, a few years later, led to the rapid decay both of Ayuttaya and Lopburi; but the ruins of both cities prove

\* Yuthia, Ayuthia, Sanskrit Ayudya, Hindie Udh, and in English Oude, the recently annexed Indian kingdom; in Hindu mythology the kingdom of the demigod Rama, the hero of the epic poem of the Ramayana.

their former extent, and contain objects of considerable interest. At Lopburi, among the wreck of Pagan temples, may also be seen the columns and other remains of the Christian Church, built by Constantine Phaulcon, the celebrated Greek adventurer, in about the year 1683, when he, who had been captain's steward of an English East Indiaman, possessed all the dignity and power of first Minister of the Crown. One of the capitals of these columns, carved in wood after a Corinthian pattern, was presented to Sir John Bowring, at Bangkok. The situation of Lopburi is much higher than the surrounding country, and was the favourite resort of the former kings during the rainy seasons, when other places were more or less affected by the periodical inundations of the Menam.

The ruins of Ayuthia are said to cover the whole of the island formed by the circuitous course of the river at this position. The island was evidently at one time encircled by a wall, and the river then served as a natural and formidable moat. Colossal idols, constructed principally of brick, which owe their preservation to a thick coating of metal, are found standing among the débris of the temples to which they once belonged. If the annals of Siam are to be believed, 25,000 lbs. of copper, 2000 lbs. of silver, and 400 lbs. of gold, were used in the casting of one of these images. The city walls have fallen down, and large trees, tenanted by vultures and owls, are growing out of their ruined heaps. A new town has been formed on the bank of the river, opposite the old site, having a population estimated at 40,000 inhabitants, many of whom reside in floating houses, similar to those of Bangkok.

The latitudes of Lopburi and Ayuthia have been observed by Captain Davis, an experienced navigator, who accompanied the present king on an expedition to both these places, and took observations by his Majesty's orders. He places Lopburi in  $14^{\circ} 48' \text{ N.}$ , and Ayuthia in  $14^{\circ} 20' 40'' \text{ N.}$

Bangkok calls for our chief notice. It is a very remarkable city, if viewed only in relation to its immense population; on which subject, however, it must be admitted there is room for a diversity of opinion. The Roman Catholic missionaries, who have resided there for many years, insist upon an estimate of 400,000 inhabitants, and the calculations of the American missionaries give no less a number than 300,000 or 350,000. From my own observation I imagine that the Chinese and their descendants number one-third of the whole population, and colonies of Burmese, Peguans, Cambojans, Cochin-Chinese, Malays, Arabs, and Indo-Portuguese, are located at different points in the suburbs. Some idea of the population may be formed from the space covered by the city and suburbs, which extend along both banks of the river



for fully 7 m. Their breadth is more difficult to estimate ; but at more than one point it is equal to the length named. The city, or rather that part of it which is enclosed within the walls, lies on the left bank of the river. The walls are about 30 ft. in height, and 10 or 12 in thickness. The palaces of the first and second kings are situated within the walls ; but most of the nobles reside without, and the temples adorn the suburbs as thickly as the city. A good view of the city and surrounding country, can only be obtained by ascending the spire of some lofty pagoda. The spectator then sees to great advantage a very striking picture, prominent in which appear the roofs of the numerous temples, which are covered with coloured tiles, and profusely gilded. Then we have the tall spires of numerous pagodas, shooting up to the height of 150 and 200 ft. ; the palaces of the two kings and of numerous nobles, fantastically ornamented, and the scarcely less picturesque houses of the people, sheltered, enlivened, and frequently hid from view by bright green foliage, principally that of fruit-trees, which are thickly interspersed in every direction. The Menam, winding through the centre of this scene, adds greatly to its beauty and its animation. Boats of all sizes are constantly flitting to and fro upon its surface, and the whole commerce of the place is transacted in the floating houses, which, moored in tiers along its banks, and extending for some distance into the stream, give to Bangkok the appearance of a city on the waters.

VIII.—*Explorations into the Interior of Africa.* By Dr. DAVID LIVINGSTON, LL.D., etc. (*Gold Medallist.*)

(Continued from Vol. XXV.)

Communicated by Sir R. I. Murchison.

Read, March 10, 1856.

1. *Dr. Livingston's Astronomical Observations for Geographical Positions on his journey from the Leeba to Angola, and in Angola on his return : between January 1, 1854, and January 11, 1855 : with calculation of the Longitudes and Latitudes therefrom, effected at the Royal Observatory, Cape of Good Hope, by T. MACLEAR, H.M. Astronomer at the Cape of Good Hope.*

Royal Observatory, Cape of Good Hope,  
29th Dec., 1855.

SIR,—The last letter I received from my friend Dr. Livingston is dated at Cassangé, Angola, January 29, 1855. He says, "I am now on my way back to the Zambesi, and thence I hope to descend to Quilimane on the east coast. It is rather a difficult task, for I

have none but Zambesians with me, and I suspect they will not be very willing to go so far from home and return again without my company. . . . I hope by God's help to reach the east coast about the end of the year.\* I did not get a single letter from any of my friends while in Angola; hence I am quite ignorant of my family and every private friend."

At the time this letter reached me, H.M.S. 'Frolic,' Captain Nolloth, was about to leave the Cape for an eastward cruise, under instructions from Commodore Trotter, Commander-in-Chief on the Cape station. By Captain Nolloth I forwarded a packet of information to be left at Quilimane for Livingston, if he should not be found there. The 'Frolic' returned two days ago, after a passage of seventeen days from Quilimane, and I am sorry to say, without Livingston and without any information respecting him: but when the difficulty of the enterprise is considered, and that the 'Frolic' left about the 10th of December, whereas Livingston (as above stated) expected to reach the place by the end of the year, you will perceive that there is no just cause, at present, for alarm respecting his safety.

The Commodore informs me that Captain Nolloth did everything in his power to impress upon the authorities the very strong interest the public take in Livingston's safety, and the success of his expedition, and that very shortly the 'Dart' will be sent off to Quilimane.

On the other hand, Mr. Moffat, Livingston's brother-in-law, is of opinion, that on reaching Sesheké, where he will find a packet of letters, he will decide to come back to Kuruman, and put off the descent of the Zambesi for the present. In either case we may expect to hear of him by the end of February or the beginning of March.

In his last letter Livingston says, "I have requested Sir R. I. Murchison to consider all my positions as '*sub judice*' till you have examined them."

Accordingly herewith I transmit the original observations and the results deduced from them.

The results and special remarks occupy pages 1-6: the original observations and abstract of the calculations, pages 8-35. The latter is in fact a transcript of the "working sheets."

You will perceive by the explanations and remarks, that no pains have been spared in these reductions:—Almost in every case the observed altitudes were compared with altitudes calculated from the times, and thus several errors (most likely errors com-

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\* News of Dr. Livingston's arrival at Teté, February 15, has since reached England, and also of his subsequent arrival at the Mauritius, August 17.—Ed.



mitted in copying) were detected. Probability too has been freely, but not unfairly drawn upon where needed. It is almost impossible to escape errors of entry and of calculation in a fixed observatory; then can we expect more from an harassed explorer in the bush threading his way through unhealthy swamps, and who has been nine times prostrated by jungle fever? It is astonishing that he has been able to accomplish so much for sound geography under the circumstances. Few, very few, explorers have so perseveringly and so geometrically fixed their tracks.

It may not be amiss here to remark, that when longitudes on land are determined by lunar distances, the altitudes for clearing the distance from the effect of parallax and refraction should be omitted, and the labour handed over to repeated measures of distance between the moon and stars or planets *both east and west* of the moon. Thus errors of contact and errors from spurious disc are eliminated by taking the mean, of the means east and of the means west. A practised computer can compute the altitudes for the before mentioned purpose in a few minutes.

The altitudes for time also, when practicable, as in the night, should be of an object east and an object west of the meridian.

I am, Sir, with great respect,

Your obedient humble servant,

T. MACLEAR,

H.M. Astronomer at the Cape of Good Hope.

To Sir Roderick I. Murchison.

## 2. *Corrections for the Quango, and the Chikapa.*

To SIR RODERICK I. MURCHISON.

Cabango, Lunda Country, 17th May, 1855.

SIR,—Enclosed is a sketch intended to correct the map\* of a part of the country through which I passed in excessively cloudy weather, and more especially to give the correct longitude of the Quango, a river of some interest and forming at present the Portuguese boundary eastwards. It is reported by intelligent natives to have its source by numerous streams in a ridge called Mosamba, 80 or 100 m. s.s.e. from our ford. And as that which we ascended gives rise to a very great number of rivulets, of from 5 to 20 yards broad and perennial, I have ventured to put the (yet ideal to me) source of the Quango on paper.

\* These corrections were embodied in the Map accompanying Dr. Livingston's Papers in Journal, Vol. XXV.—Ed.

I was unfortunate with the Chikapa; the part at which we crossed ran w.n.w., and being subsequently misinformed as to its flow into the Quango, I put it down instead of that which I now find to be the Kukumbi. A portion of our route is put about a degree too far east.\* The error arose from my being unable to obtain any observation for longitude in that part. I hope this may reach you before the map sent you from Cassangé is printed. I am a little ashamed at having made the mistakes, but after all the confession is only letting you know, that I am better informed now than I was before.

Although the country is exceedingly well watered there are no fountains. The rivers, although requiring canoes and containing hippopotami and alligators, seem all to ooze out of bogs. Indeed nearly all have margins of 100 or 200 yards of bog, which renders the passage extremely difficult. These must have considerable influence on the salubrity of the country.

I intend to turn southwards in a day or two, having obtained here at Cabango the chief object I had in view in desiring to visit Matiamvo, viz., information as to the Casai being a navigable river in his country. It is, I am sorry to find, obstructed by cataracts even westward of Mai and there is a large water fall near his town. But there is a large branch which enters the joined rivers (Quango and Casai) from the n.e. which contains a large body of water and "waves." It is named by the people of Mai the "Lobilash."

Hoping you will excuse the trouble I give,

I am, Sir,

Your most obedient servant,

DAVID LIVINGSTON.

\* [NOTE (to accompany the Map), as I am nearly blind at present from a blow on the eye by a branch in riding.—D. L.]

The Quango in lat.  $9^{\circ} 49'$  s. and  $9^{\circ} 52'$  s. winds in long.  $18^{\circ} 25'$  E. and  $18^{\circ} 30'$  E. It is reported to rise by numerous branches in the ridge, called Maamba, which resembles that of Tala Mungongo.

Forded the Chikapa in lat.  $10^{\circ} 10'$  s. and long.  $19^{\circ} 42'$  E.

Forded the Maomba in lat.  $9^{\circ} 38'$  s. and long.  $20^{\circ} 13' 34''$  E. As the observations at Maomba were numerous and good, the long. of Cabango is reckoned thence, the moon being at present too near the sun.

Cabango, lat.  $9^{\circ} 31'$  s., long.  $20^{\circ} 31'$  or  $32'$  E. It is a trading station and village of Muanzanza with 200 huts.

\* Njambi placed on  $19^{\circ}$  and Panza on  $20^{\circ}$ , the route being prolonged in one case, in the other shortened.



Results of Dr. LIVINGSTON'S Observations on his Journey from the Leeba to Angola.

(Continued from Vol. XXIV., pp. 301-306; Vol. XXV., p. 219.)

DATE.	STATIONS.		S. LAT.	E. LONG.
1854.			° ' "	° ' "
Jan. 1 ..	Kabompo's (near the Leeba) ..	I.	13 0 34	Not observed.
Feb. 1 ..	Village about 2' beyond ford (s.w.) of the Leeba, after leaving Kabompo's town. The hills Peerie or Piri bearing s.e., and about 6 distant .. .. .	II.	12 6 6	22 57
Feb. 7 ..	Village of <i>Soana Molopo</i> , 3' from Lokaloye River ..	III.	11 49 22	22 42
Feb. 11 ..	Village of <i>Quendende</i> , about 2' s.e. of ford of the Lotembwa, and about 9' from town of Katema .. .. .	IV.	11 41 17	*22 16
Feb. 17 ..	Katema's town: near the lake Dilolo, the source of the Lotembwa, and <i>that</i> one of the principal sources of the Leeba	V.	11 35 49	22 27
Feb. 28 ..	Village near the ford of river Casai, Kasye or Loké. The ford may be said to be in latitude 11° 17'. "This is a very important river: it flows into the country of Matiamvo" ..	..	11 15 55	Not observed.
March 8 ..	Banks of stream Chihuné ..	VI.	10 57 30	20 53
April 5 ..	Ford of the river Quango or Coanga .. .. .	..	9 50 0	.. ..
Ap. 13 & 17	Cassangé (about 40 or 50 miles w. of the river Quango or Coanga) .. .. .	VII.	9 37 30	17 49
May 19 } Oct. 27 }	Golungo Alto .. .. .	VIII.	9 8 30	14 51 } 15 9 }
Oct. 6 & 7	" <i>Aguas doces</i> " in Cazengo: "10 miles w. of Golungo Alto" .. .. .	IX.	9 15 2	14 27
..	Confluence of Luinha and Lucalla .. .. .	X.	9 26 23	Not observed.
Oct. 11 & 12	Massangano, town and fort ..	XI.	9 37 46	Not observed.
Dec. 6 ..	Ambaca, residence of Commandant .. .. .	XII.	9 16 35	14 48? more probably 15 23

\* Quendende lies s.e. from Katema's town, which latter is in longitude 22° 27". It is therefore probable that Quendende is in longitude 22° 31".

Results of Dr. LIVINGSTON'S Observations on his Journey from the Leeba to Angola—continued.

DATE.	STATIONS.		S. LAT.	E. LONG.
1834.			° ' "	° ' "
Dec. 11 ..	Pungo Andongo, on the river Coanza .. .. .	XIII.	9 42 14	15 30
Dec. 22	On the river Coanza. 2' w. of Pungo Andongo .. .. .	XIV.	9 47 2	Not observed.
1855.				
Jan. 2 ..	Candumba, 15 miles E. of Pungo Andongo, 300 yards N. of the Coanza .. .. .	XV.	9 42 46	*15 16
Jan. 3 ..	Confluence of Lombe and Coanza, 8 or 10 miles eastward of Candumba. Station, house of Mr. Pires about $\frac{1}{4}$ mile N. of Confluence .. .. .	XVI.	9 41 25	†15 18
Jan. 7 ..	Sanza, on river Quize .. ..	XVII.	9 37 46	16 59
Jan. 10 ..	Banks of the Quize or Culje, near its source, 2' w. of the sudden descent, which forms the valley of the Cassange ..	XVIII.	9 42 37	17 23
Jan. 11 ..	Tala Mungongo, 2 miles E. of preceding station .. .. .	XIX.	9 42 37	Not observed.

## REMARKS.

v. Katema's town.—Dr. Livingston's date is Feb. 18, 19 hours, but the 17th is clearly the correct date as shown by the ☾ distance from the ☿. It was on the 18th civil reckoning.

vi. Banks of the stream Chihumé.—Two sets of lunars were observed here, but the original observations are not given in full detail. The calculated watch errors from the given data differ 3<sup>m</sup> 43', but as the resulting longitudes differ only 7', it is probable that the watch was altered between the times at which the distances were observed.

vii. Cassangé.—5 sets of lunars were observed here. In the 1st set 10' have been deducted from the last three observed distances, and 3<sup>m</sup> from the time at which the first altitude of the ☿ was observed.

The ☿'s altitude is calculated for the fourth set, as there is, apparently, some error in the observed altitudes, or in transcribing the numbers.

viii. Golungo Alto.—The longitude on Oct. 27, is the mean of 2 sets of distances of Sun and Moon, giving results differing 9 $\frac{1}{2}$ ' from each other; that on May 19 also from 2 sets of Sun and Moon, differing 1' from each other, the watch errors in both cases derived from observations of the sun. Dr. Livingston gives as the result of 7 sets of lunars observed and reduced by him = 14° 59', but he has not sent the

\* If the longitude of Pungo Andongo, viz. 15° 30', is correct (which there appears no reason to doubt) and Candumba is 15' to the E. of that place, the longitude of the latter place will be 15° 45' and not 15° 16'.—J. A.

† The junction of the Lombe with the Coanza is about 25' E., and not as above 12' w. of Pungo Andongo, and 8' or 10' E. of Candumba; the junction is therefore in longitude 15° 56' and not as above in 15° 18'.—J. A.



observations. He states that Golungo Alto is about midway between Ambaca and Loanda.

IX. *Aguas doces* at the confluence of the Luinha and Luce in Cazengo.—This station is not more than 10' west of Golungo Alto according to Dr. Livingston.

The resulting longitude is the mean of 2 sets of the observed distance between the Moon and Jupiter, differing 3' from each other, the time being deduced from the altitudes of Jupiter. The watch errors are accordant and no source of error can be traced.

XI. Massangano.—The longitude not observed, but "a prominent hill in Cazengo called Tunga is about 6' s.s.w. of *Aguas doces*, and it bears N.E. by E. from the house of the Commandant at Massangano."

XII. Ambaca, residence of the Commandant of the district.—The longitude from one set observed between the Moon and Aldebaran, and one set between the Moon and Jupiter; the results differing 4'. The time from two altitudes of the Moon and the watch errors accordant. This station is east of Golungo Alto (see above). The correct limb of the Moon has been observed, and no source of error can be traced in the observations.

XIII. Pungo Andongo.—4 sets of distances of the Moon from the Sun were observed here. The first three give accordant results for longitude, the last differs 10'; the time is also well determined from the altitudes of the Sun.

XV. Candumba.—The longitude from one set of measures of distance between the  $\zeta$  and Aldebaran, and 2 sets between the  $\zeta$  and Jupiter. The results differ 22'. The time derived from altitudes of the Moon: the greatest difference of watch errors = 6".5.

XVI. Confluence of the Lombe and Coanza. The longitudes are derived from one set of distance  $\zeta$ —Aldebaran, and one set  $\zeta$ —Jupiter. The results differing only 1', and the watch errors 3".3 from two altitudes of the Moon. Procyon was observed for time, but there appears to be some error in the observation or in transcribing it. This station is 8 or 10 miles east of Candumba, and both are to the east of Pungo Andongo (according to description), whereas the observations place them both to the west of it. In the case of Pungo Andongo, if we were to calculate on the assumption that the *upper* limb of the Sun had been observed, the longitude would become about 15° 0' which is in accordance with the other two positions; but this is inadmissible, as the watch error given by the Moon, whose upper limb must have been observed, agrees nearly with that deduced from the Sun.

At this station the Coanza takes its southern bend to S.E. or S.S.E.

XVII. Sanza.—Longitude from 4 sets of distances  $\odot$ — $\zeta$  and greatest difference of the results 15'. The watch errors are derived from observations of the Sun, and are accordant.

XVIII. Banks of the Quize near its source, 2' west of the sudden descent which forms the valley of the Cassange. Longitude from one set of distances of  $\odot$ — $\zeta$ . The time from the altitudes of the  $\zeta$ . The watch errors differ 3".2.

## IX.—*Visit to Moselekatse, King of the Matebele.* By the Rev. R. MOFFAT.

Communicated by the LONDON MISSIONARY SOCIETY.

[THE health of our honoured Missionary Brother having suffered considerably from his unremitting labours on the Sechuana Scriptures, he undertook an extended journey into the interior, partly for relaxation, but chiefly with a view to renew his acquaintance with the barbarian king of the Matebele, and to obtain his aid in forwarding supplies to Dr. Livingston, then absent on his fourth exploratory tour.

We have just received Mr. Moffat's long-expected journal, comprising the







varied incidents of his visit to Moselekatse's country, situated about 400 miles north-east from the Kuruman; and the singular interest of its details will, we trust, form a sufficient excuse for the unusual length of our extracts.

In his 'Missionary Labours and Scenes in Southern Africa,' Mr. Moffat has given a lively account of two former visits he paid to Moselekatse—first in the latter end of 1829, and again in 1835.]

*June 12, 1854.*—After spending eight days with Sechele and people, I left his village, in company with Messrs. Chapman and Edwards, whose objects were hunting and trading. We travelled in a northerly direction through a country rather thickly wooded. Some of our number went out on horseback to procure game, but were not successful. All this country, and far to the south, was not long since swarming with elephants, giraffes, rhinoceroses, buffaloes, elks, and many species of antelopes, and one would have thought, from the immense extent of comparatively uninhabited country, that they would have continued to abound for generations to come, but the musket, the rifle, and the fleet steed have made them scarce, and the poor natives have to suffer from this cause.

*Lopépe, June 15.*—This place is always talked of as a den of lions. It is a valley, at the upper end of which there is a deep hollow covered with reed, along the outsides of which there are deep pits, but at present filled with water, and the oxen can drink without trouble.

*June 16.*—We, at least some of us, felt thankful for a quiet night. Lions were heard roaring at a distance, but thanks to the "Preserver of men," no evil was permitted to come near us. Started early, halted awhile at midday, clouds few and distant, sand hot, road heavy. The Bamanguato mountains nearly east, but we must take this circuitous course to obtain water.

*June 18.*—Enjoyed an undisturbed Sabbath in the desert, for a desert it is, being the eastern verge of the great Kalahari. When the waggons stand we have to walk about to the ankles in fine white sand, which extends in all directions. This part of the country wears a dreary aspect, not a living creature to be seen except a few crows, and, towards evening, flocks of doves and wild pigeons coming to drink. I also observed at a distance a "mogolego," the adjutant of the East Indies, a place, one would think, not in keeping with his rapacious habits.

*June 19.*—We left soon after midnight, and halted again at 8 A.M. On passing through the first range of the Bamanguato hills the scenery became much finer. After crossing these we passed over a level plain of about 7 m., covered with bushes, a few trees, and thick grass. We then passed through extensive fields of native grain, much still remaining unreaped. We halted a little way out of the town before sunset. The town extends for miles along the



base of a range of mountains, stretching from E.S.E. to W.N.W.; they appear black and sterile, and scantily covered with trees and grass. Here we met with three traders, and also Sehunéloe, one of our Kuruman members, who had, previous to his settling among the Bahurutse at Mosega, as an assistant in the mission work, come here on a visit. We soon had a swarm of natives around us. As they had heard of our approach, and had seen my fellow-travellers before, I was set down for the veritable Moffat, of whom they had long heard. They stared at me inquisitively, some asking, "Is it he?" while others answered, "It is himself—salute him." Among other curious salutations, I heard some in broken Dutch, call out, "Good evening—morning." On observing our people fastening the dogs to the waggons as soon as the oxen were unyoked, I inquired the cause, and found that the Bamanguato were shameless thieves, of dogs not excepted, from the chief to the beggar.

I sent to convey my respects to his most uninviting majesty Sekhomi, with a message that my heart was grieved to find that all Livingston's letters and papers were still here, though Sekhomi had promised to forward them half-way to Linyanti, where was a person waiting to convey them to Livingston. From all I have heard of Sekhomi, he has not only a forbidding appearance, but is the very personification of greediness, selfishness, impudence, tyranny, and deceit. Of course I shall treat him with all due respect.

*June 20.*—Shoshong (Sekhomi's Town). This morning, at an early hour, Sekhomi, who had been often heard to say that he would not give up the letters and papers until Livingston himself should come with a large reward, sent down the parcels, the very sight of which grieved me. Most of them ought to have been sent a twelvemonth ago. Soon after a number of men presented themselves before my waggon, and a rather insignificant person saluted me, to which I answered by remarking that I was going to see the chief. He laughed, and added, "I am Sekhomi!" I remarked that he was beforehand with me, as it was my duty to wait on him as my superior, according to custom. He admitted this with something like a smile, but appeared quite at a loss to know what to say. He felt he had got into a difficulty and lost my esteem (if ever I had any for him), by not forwarding Livingston's parcels, for which he knew well he would be rewarded. He tried to get out a sentence or two in palliation of his ungrateful conduct to Livingston, who, I knew, had been kind to him, but made such a bungling excuse, that I recommended him to confess at once that he had behaved badly, and I should then hope he would improve some day. I tried to convince him how sorry I was, but he only laughed, and tried to divert my thoughts

from the subject, by telling me how glad he was to see me. The subject of Christian instruction was introduced, and its importance enlarged upon, but it proved most unwelcome.

The Bamanguato, in general, seem to have a high opinion of the Kuruman. I have met with several who have been in service at that station, and they have returned with a good report. Two only among the many thousands of the Bamanguato know the alphabet. They are, indeed, dark and ignorant; nor can it be wondered at that they are so rude and rough in their manners, when it is remembered that they have, during the present generation, been continually driven to and fro, scattered and peeled.

*June 21.*—It being hopeless at the present time to get either Sekhomi or his people to listen to instruction, we left in the afternoon, and, after travelling nearly 9 m. through gardens, we halted at the end of the mountains where the Bakaas tribe formerly lived, and where, though the owners of the country, they were terribly harassed by the Bamanguato. After these, who were more numerous, came from the north and took possession, Sekhomi did everything in his power to annoy the Bakaas, who were always reported to be a peaceable people. They at last abandoned their native hills, and, encouraged by Sechêle, fled to the Bakuanas, where they now live in comparative peace.

*June 22.*—After coffee we started again in a north-easterly direction, over a bushy country, threading our way like serpents among grass, without the smallest track of a road of any kind, and through very long grass. After some 8 m. travelling in this way we reached Mahalapi river, which runs into the Limpopo. It presented a perfectly level bed of granitic sand 67 yards wide; though no water appeared where we crossed, on the surface, there was abundance below. During the rainy season it must have a fine appearance, though perhaps it would be almost impossible to cross with waggons. Leaving the north bank some hundred yards we made a secure fold for our oxen.

*June 24.*—From the top of a small hill, near us, sufficiently large to enable one to look over the trees in the plain below, I took a survey of the country beyond, but could see no smoke rising in any quarter to indicate the abode of human beings. From hearsay our course from this must be nearly east in order to get water. In the same direction considerable hills are seen terminating at or near the Limpopo. These are infested with the Tsétse; of course we shall give them a wide berth. From the Bamanguato hills, till near this place, we have been riding over a granite foundation, in some places jutting out in large blocks or boulders, and at other places in broad, bare masses, and sometimes with a thin sprinkling of sand and grass; but in many places the soil, though more or less granitic, is deep and rich, covered with a



luxuriance of bushes and grass. Plants and shrubs, which are dwarfish at the Kuruman, are stately in these quarters. Here we again meet with coarse-grained sandstone quartz, and some fine, large specimens of pudding-stone.

*June 25.*—Hyenas and jackals kept our dogs busy during the night, but we enjoyed a peaceful Sabbath in the silence of the desert.

*June 27.*—Yesterday morning we started at 8 A.M., and groped our way through thickets and high grass, but the ground was so hard that the waggon-wheels made no impression, nor would our track be discovered except by the grass being pressed down. However we persevered, though not without considerable toil, and we shall persevere, notwithstanding Sekhomi's vain hopes that we shall be lost without guides. The Chopo hills, where the Tsétse abound, lie only a few miles to our right, where anything like oxen and dogs cannot exist. These hills are said to abound in copper and iron ores.

*June 29.*—On Wednesday night we halted for a short time at a river, which we afterwards learned was the Serule, literally, "do not sit or remain," and it appeared to deserve the name, for, independent of the water being very brack, the shores indicated that it was the abode of lions, rhinoceroses, and other game. Having allowed our oxen just time to drink, we went out some miles from the valley to pass the night, which we did with more comfort than we had anticipated. Mr. Edwards also obtained a supply of game. To-day we entered amidst a number of high hills, the first we had met with since we left the Bamanguato. We saw a small village of poor people under a neighbouring hill. Some of the men, on observing the waggons, came, and as we thought, kindly put us in the right direction, but which afterwards proved too far east. They told us that Sekhomi had sent word that no one should direct us to where Moselekatse lived. Poor fellows! as they appeared willing to serve us, they got over the difficulty by stating, that if we went in that direction we should reach the Shashe river, which was the same thing. Mr. Edwards very kindly shot a giraffe and a quagga for these hungry children of the desert. They looked very thin, and miserably clad. Pursuing our course we came at sunset to a small village, pointed out to us by those we had passed. They lived by the bed of a small periodical stream, where we found no water for our oxen. They had a few patches of garden ground which they had harvested, and which enabled Mr. Edwards to purchase some grain for the horses. About fifteen of the inhabitants came with their children to see our waggons, all miserably poor, but very willing to serve us for a few beads. With our guides we left the following morning, and, before proceeding far, we passed one of the gigantic moana trees, which may be termed

the forest king, and, when in foliage, must resemble an enormous cabbage on a very thick stalk. The height from the ground to the first branches was about 20 ft., with a circumference of 36. I have heard of some double this size. It is so soft that a knife may be pushed into the trunk with little difficulty. At noon we were thankful to meet with water in the Lobala valley. Soon after starting Mr. Edwards shot a quagga, which made our new friends look sprightly. As usual, we halted in time to cut down thorn trees to make a fold. This, though hard, being the work of every day, Sabbath excepted, we think nothing of it, having good axes—valuable articles on a journey like the present.

On the 1st July we reached Motlotse river, which, like all the others we have passed, runs into the Limpopo, when it does run, but at present it is only a bed of sand 60 yards wide.

*July 4.*—Shashe river. We had yesterday to cut nearly our whole course of 14 m. to get to Malabe valley, which, like most others, gets the name of river; and, starting again this morning, we proceeded, and after again cutting down many trees and rolling fallen ones out of our way, we, in a few hours, reached the Shashe river, so long looked for. The descent was steep, stony, and difficult, and the bed, as is usual with all rivers in this part of the country, about 80 yards wide, of deep granitic sand. Nearly all the rivers we have passed, as well as many northward, fall into this river before it joins the Limpopo. Passed to-day some small hills of granite. On the banks of the river we met with mountain limestone, and in the bed of the river large masses of opaque quartz rock. After 13 m. tugging, over rather heavy ground, we came to the banks of the Ramokhuabane, along which we had been travelling for several miles. It was alarming to look down into its deep sandy bed, 300 yards wide, through which our waggons must be dragged. Our oxen having had a hard pull, they were unyoked to drink and graze a couple of hours, after which we succeeded in ploughing through the sand, into which the wheels sometimes sunk to the naves. Our waggons have had hundreds of hairbreadth escapes, but all went well till to-day. As Mr. Edwards's waggon was passing among the same large trunks of the mimosa tree, the hinder wheel caught in one of them and wrenched off the arm, so that we shall have to remain here over to-morrow to put in a new axle-tree.

*July 8.*—The country having now become undulating and billy it was evident that our course would be proportionally difficult, which we were soon made to feel. We had not proceeded far before we became completely bewildered among hills and deep gullies, the banks of a sandy river in front being impassable. After some hard twisting and turning we changed our course, and by running to the tops of hills to look beyond, and the aid of the



compass, we crossed the river, and found better ground for travelling. At sunset our progress was arrested by a deep rocky ravine, at the bottom of which were large pools and a running stream.

*July 9.*—We spent as quiet a Sabbath as could well be conceived.

*July 10.*—After examining the course, in order to avoid the road by which we entered, we made the best of our way w.n.w. through some truncated hills. After travelling in this way for some miles we turned N.E. into another opening in the hills. We had not proceeded far when footpaths were seen, and soon after voices were heard of persons, who, supposing us to be Boers, were making their escape into a rocky defile. As Mr. Edwards and another were on horseback they intercepted some of them; these mountaineers were desperately afraid till they heard who we were. They proved to be some of a number of Bamanguato, who were here when Moselekatse conquered the country, and have continued to be his subjects. We got two of them to guide our waggons to a neighbouring village of the same people, where they said were some cattle, and an officer belonging to Moselekatse. With grateful hearts we saw that all was right, and much sooner than we yesterday anticipated. After advancing several miles we were met by a company of the same people, who requested us to halt till they should communicate with a chief man at a village about 5 m. beyond. To their inquiries as to what they were to say to the chief man, they were told that I was Moffat, or Moshéte, as they pronounced it, of the Kuruman. Though no one of the scores who were standing round had seen me, they appeared quite familiar with the name, and all knew that their sovereign was anxious to see me. The messenger must have been a swift one, as the Letebele made his appearance in an hour and a half with several attendants. He saluted with rather an awkward, but hearty shake of the hand. He assured me, again and again, of the delight Moselekatse would have on hearing of my long looked-for arrival. On mentioning the names of some Matebele I knew, and inquiring about their welfare, he snapped his fingers apparently with great satisfaction, as this was an additional proof that I was the veritable Moffat, for, as I afterwards learned, if he had taken a counterfeit Moffat to his master, his days would have been numbered in a few seconds. He said he would send messengers to head-quarters to request that persons should be sent who knew me; that he had seen me when he was a boy, but I had then a long black beard. We started again for the village where he was residing pro tempore to collect taxes, which we reached the same evening.

*July 11.*—Mr. Edwards and I took our guns and walked out to the woody heights and cornfields lately harvested, to seek pheasants

and guinea fowls. We were struck with the beauty and fertility of the country. We also found hundreds of acres of new ground prepared for next year's sowing. The trees were hewn down and the branches laid round the bottom of the trunk to be burned when sufficiently dry. The ground is all made up in ridges about 15 in. high, and from 4 to 6 ft. apart, so as to allow the water to run off. The grain is sown on the tops of the ridges, where it appears to grow luxuriantly. The whole country, as far as the eye can reach, is very mountainous, and these mostly isolated, and frequently composed of enormous blocks and boulders. Blocks may be seen 30 or 40 ft., standing on one end on the top, and sometimes on the brow of hills, which the slightest touch of an earthquake would bring thundering down hundreds of feet. Though these mountains are rugged, they look fine, being partially or nearly wholly covered with trees, many of which are evergreens, or in leaf nearly the whole year. Trees may be seen, chiefly of the ficus tribe, growing on the solid granite rock, and with trunks running up perpendicular walls of great height, and adhering so close to the rock, and being of the same colour, it requires a near approach to convince one that they are not parts of the rock itself. A fine field for the botanist as well as the geologist! I saw some trees and shrubs entirely new to me, but, not being in flower at the time, could not tell to what genus they belonged. Granite of various grain predominates; indeed the foundations of the whole country appear to be granite, with enormous blocks of quartz, which is also found filling up large rents and furrows in the solid rock; also slaty gneiss and pieces of basalt in the bottoms of rivers, as if washed down from higher places. It would appear as if grain might be cultivated anywhere, even at the tops of hills, where the soil is frequently very rich. Though rain has not fallen for months I found some places quite damp, and the débris of the granite hills and the sand afford an easy passage for the water to the numberless small rivers, so that the water is, except during the rainy season, undergoing a constant filtration. In the evening two Matebele women came down from the village to see the friend of their chief. They are altogether different in their dress to that of the other tribes. On asking if they knew me, they said, "We know your size, your nose, and your eyes, but what has become of the long black beard?" they inquired. I found that these two respectable-looking matrons, and two others, had been charged with bewitching at head-quarters, and were banished to this distant outpost. This, to say the least, is a merciful punishment for the Matebelian tyrant.

*July 14.*—Having got in readiness we started again with a company of Bamanguato, who were to be our guides and assistants



under one who is their chief, called Mapongko (words or news), and, being as familiar with the Letebele language as his own, he will serve as an interpreter. After having passed through a picturesque country—fine water and abundance of pasture—we halted at what is called the M'akue river, having travelled 18 m. in 9 hours, with frequent hindrances from cutting down trees and seeking roads across ravines. Last night slept near some large masses of granite, near a range of pools; the night cold, with heavy dew, although the atmosphere appeared dry during the day. The country exceedingly picturesque. Mountains and trees numberless as their shapes. Wherever the eye is directed nothing but hills on hills rise in endless succession; nearly all are covered with enormous granite blocks and trees, though, to a superficial observer, there appears to be scarcely any soil. We also passed hills, some not less than 6 m. in circumference, exactly resembling the half or third part of a perfect sphere above the ground, solid granite, and, to the eye, as smooth as an orange, without a single tuft of grass or loose pebble on the whole surface. Having scrambled part way up such granite globes it appeared to me that not a particle, not even grains of sand had laid on them since washed by the waters of the flood. The alluvial deposits accumulated in the valleys between these hills are exceedingly rich, and send forth luxuriant brushwood and grass. Sometimes the granite crops out in large flat masses, and having been washed by the rains of some thousand summers, these are employed as threshing-floors, being in the vicinity of gardens. Blocks rising above trees, on the tops of hills, might, without much effort of the imagination, be taken for ancient castles, surrounded with broken ramparts. I examined a single block near to where we passed, on an entirely level surface of rich soil. It exhibited a perpendicular face of 50, by 40 ft., smooth as if it had been chiseled, and looked as if intended for a base to some stupendous monument. Among the débris of the surrounding hills are large quantities of quartz, blue stone, mica slate. It is very evident, from the appearance of these mountains, that there have been no earthquakes here since a very remote period, or otherwise thousands of boulders of great magnitude would have been hurled from the dizzy heights, where they seem to tremble with a breath of air.

Besides minor streams we have to-day passed the M'akue and Samokone rivers, all containing plenty of pure water; and we are now bivouacked on the Shashane, or, literally, Little Shashe river, where the grass is so rank and tall, that it is not without great risk of setting the camp in a blaze, that we can make a fire.

*July 19.*—Last night, when about retiring to rest, two messengers from Moselekatse arrived, who had left yesterday morning, and had travelled most of the night. The principal one delivered

the message with great animation, and with many extravagant expressions about the delight the news of my arrival had imparted to the sovereign. Observing him to be evidently much fatigued with his run, I remarked that, instead of starting early to-morrow, we should defer till the afternoon following, that he might rest. To this he would on no account agree, adding, "No rest for me. I want none till I see you in the presence of Moselekatse." We accordingly started early, and, after much winding, got through a range of high precipitous hills. All the rivers we passed, since leaving the Banguaketse, run to the E. and E.S.E. We have passed to-day rivers which all flow to the N.W., while farther to the right there are still tributary streams going to the Limpopo. We are thus travelling along the backbone, or highest place of this part of Africa, between  $27^{\circ}$  and  $29^{\circ}$  E. long. All the rivers to the N.W. turn N. and fall into the Zambesi.

After passing over what appeared the higher part of the country, from the rivers running N.W. and S.E., it became more open and undulating, with a few solitary hills of granite.

*July 21.*—Taking leave of our wondering friends, who followed our waggons for a couple of miles, we travelled with more ease, and passed three rivers, which, though not flowing, contained numberless pools of fine water. We descended considerably to-day, and the country from N.W. to nearly E. lay before us like an extended woody plain, with some distant heights, but no mountains. Ever since entering the tropics we have had the trade-wind blowing daily from the E., or nearly so; and this being the season to burn the grass, the smoke may be seen resembling an extended, dense thunder-cloud on the western horizon, behind which the sun descends in darkness. Before halting we were met by men sent by Moselekatse with a message that we should beat the oxen and hasten our arrival.

*July 22.*—Last night, after having all got fast asleep, a man arrived from the town with an ox to be slaughtered. The native idea was, that we must kill and eat the whole night, and start on the coming morn. It was kindly intended, but not according to our way of doing things. On we went, and as we passed some towns, out rushed men and women to see us. It was a favourable opportunity; for no one dares come to head-quarters, except on special business, so they made the best of the time they had. Early in the forenoon, as we approached the royal residence, we met men with shields and spears coming in succession to inform us of the king's happiness at our arrival. We, as a matter of course, expected to see some such display as I had witnessed on my former visits. Being considerably in advance of the waggons we entered the large public fold, and, following a chief man, were led to the opposite side, where sat in different parties about 60 chief men.



The town appeared new, or rather half finished. There was nothing like the finish I had seen before in regal towns. We stood for some minutes at a doorway in the fence, which seemed to lead to premises behind, where some kind of preparations were going on. While our attention was directed to the waggons, Moselekatse had been moved to the entrance where we were standing. On turning round there he sat on a kaross, but how changed! The vigorous and active monarch of the Matebele, now aged, lame in the feet, incapable of standing, or even moving himself along the floor. I entered, and he grasped my hand, gave me an impressive look, drew his mantle over his eyes, and wept. Some time elapsed before he could even speak or look at me. In the meantime Mr. Edwards, who had gone to direct the waggons, came up, little expecting to see the hero of so many battles, and the conquering tyrant of so many tribes, bathed in tears, which he endeavoured in vain to hide, probably from some of his wives who stood behind him, and his nobles who stood waiting in silence without. After some minutes spent in this way he repeated my name several times, adding, "Surely I am only dreaming that you are Moffat." I remarked that God, whom I served, had spared us both, and that I had come once more to see him before I die, and, though very sorry to see him so ill, I was thankful to God that we were permitted to meet again. He pointed to his feet, which I had observed to be dropsical, and said that they, as well as other parts of his body, were *killing* him, adding, "Your God has sent you to help me, and heal me."

*July 22.*—He continued the rest of the day watching all our motions with apparent pleasure. Towards evening I sent him two chairs, with which he was greatly pleased.

*July 23.*—After a rather short night's rest, disturbed by thoughts to which my present situation and duties gave rise, I awoke, with considerable pain in my right knee, which was much swollen and inflamed. It increased so rapidly that I soon found difficulty in walking. Having prepared some medicine for the chief, I was obliged to take it to him myself, as he can trust no one, not even one of his many wives, for fear of being poisoned. He expressed great concern about my knee, and, as is usual among all the tribes in this country, said it was sure to get better. In the evening Moselekatse sent a number of large calabashes of native beer. I sent word that though I felt thankful for his kindness, he must remember that I do not take beer, and I would much prefer a little milk. He said he knew I did not drink it, but it was intended for my fellow-travellers and company, and that orders had already been given that milk should be supplied.

*July 24.*—We saw William, the captive Griqua, who with his cousin Troi, the Griqua maid, was taken by the Matebele on the

Vaal River, more than 20 years ago. He could scarcely make himself understood in his own, the Dutch, language. He speaks the Letebele, or Zulu tongue, with great fluency, is dressed like all the rest, and his sovereign has honoured him with a ring on a shaven head, and is thus an *eutona*, or chief man, and allowed to have a wife. He has the charge or government of two towns, and is a centurion, having the command of 100 machaha, or warriors, and, from all I could learn, is one in whom his chief places great confidence. It was rather curious to see a Griqua, in whom the Hottentot features predominate, in the dress of the Matebele. He appeared simple and good natured, and informed us that Troi, his cousin, who lived at a neighbouring town, was here yesterday, but dared not approach the waggons. He said Moselekatse was very good and kind to him, but, heaving a sigh, added, "My heart still desires to return to my native country and friends." Here vassalage marks the motions of every mortal but the monarch, not even excepting his own sons and daughters. When any approach, they stoop, and, in passing within sight of the despot, must address him by one or more of his titles.

Mr. Edwards sent his majesty a present, in the shape of a large tartan shawl, pieces of print, calico, and a canister containing a large quantity of superior beads, which were acknowledged with many thanks, and presently afterwards they were sent to my waggon, which he makes his storehouse. Can he not trust his own people?

July 26.—In the evening we were rather taken by surprise to see his sable majesty walk out alone to our waggons. Medicine and regimen had done him good. He was received by his subjects with shouts of congratulations.

July 27, Saturday.—Nearly the whole day reading and correcting some typographical errors, and altering some words in the translation for the sake of uniformity, my knee preventing me from moving about. The wind cold and disagreeable; the trade-wind, as usual, with thick misty clouds and sand, sweeping over our heads. When the natives were asked if it would not rain, they laughed, and said, "Who ever saw rain during the winter months?" They appear no more to expect this than that the wind should blow from the west any part of the year.

Moselekatse's dominion extends from the Shashe River on the south to the Zambesi on the north, and all the numerous canoes and boatmen on the southern bank acknowledge his authority. On account of the *tsétse*, or fly, much of the country towards the Zambesi cannot possibly be occupied with cattle; they are swept off immediately by that small but overwhelming insect. The scattered inhabitants have abundance of game; and are able to keep sheep and goats, which do not suffer; it is remarkable that this should be



the case, for though their hair or wool is thicker than other animals, there are vulnerable parts, which the tsétse can easily reach ; dogs immediately fall victims.

This morning I said to my interpreter, and to another who might be called the king's aide-de-camp, that I wished to convey to Moselekatse all my plans, and what I wished to accomplish during my stay. When I mentioned Linyanti, and that, as I had goods, &c., for Livingston, I intended to go thither, or as near the Makololo as I could, in order to forward his supplies, the proposal seemed to operate on them like an electric shock, and they supplicated me most humbly, for the sake of their lives, not to send them to their master with such a message ; that I must on no account whisper such a thing—the king must first see me for a month or two to come. The day has been so windy, cold, and damp, his majesty has kept within doors, and one or two, who may be considered sheriffs, being absent, some women from the harem, and others who had brought beer, &c., to the town, took the favourable opportunity of drawing near to have a look at me. Though cold, they had nothing like dress on the upper part of their bodies, and, according to the Matebele custom, very little anywhere else. They appeared very cheerful and happy, most of them with arms over each other's necks. They acted with great decorum, and when they retired they said they were glad I had come, and were thankful for the opportunity of seeing me. By far the greater part of his people are not pure Matebele, but from the tribes whom he had subjugated during his long career.

*August 2.*—Moselekatse never fails, now that he is able to walk, to visit our waggons, and never fails giving Mr. E. and me a shake of the hand as he passes to and fro, with the accompaniment of a *Kia ituméla* (I am glad). His cheerfulness increases with returning health. From the Mashona, whom I have seen, I should infer that they were more industrious, and of course more civilized, than the Matebele. They formerly occupied all the country about Matlokoitloko, the present residence of Moselekatse. Their country, or rather their mountains, commence about four days' journey east of this. Thither they fled before the conquering bands of the Matebele. They possess a few cattle of a very dwarfish description ; their sheep and goats are also smaller than the usual size. Among the latter I observed a number of the Angora goat, most of them being white, and their long soft hair, covering their entire bodies to the ground, made them look like animals moving along without feet.

The Mashona have more or less intercourse with the Portuguese, or tribes contiguous, for they barter from that quarter coarse cottons, though they themselves make garments of cotton of a very coarse texture. I also saw among them two musical instruments, con-

sisting of about forty notes, composed of as many strips of iron fastened to a small board within a large calabash, into the opening of which the two hands are introduced, playing in the same manner as one would on the pianoforte. The instrument exhibits considerable ingenuity, and, for a people so barbarous, is a successful one. Their dress, though rude enough, is much more decent than that of the Matebele, and indeed they seem to be an entirely different people. Their language is the same as the Makalaka tribe, of which, though a branch of the Sechuana, I could understand but little. The Mashona say their fathers emigrated from the south-east, beyond the land of the Baraputsi. Some of their customs are peculiar, different from any other tribe I know.

*August 4.*—Had some conversation with Moselekatse, and tried to make him understand that the world moved, and not the sun; that the earth was a globe, and not a flat; that people could go round and round, and, were a hole pierced through its centre to the other side, he would find people on what would also appear to him a plain or sea. He looked rather bewildered at these facts, for he had no idea that I was deliberately telling falsehoods. I described to him the speed with which waggons travelled in England, and ships on the sea; but it seemed like multiplying words to no purpose, as it was far above his conception. He, however, freely admitted the superior wisdom of the white man, which afforded me an excellent text to explain to him the process by which the Maengelise, as he calls them, have reached their present state of refinement and wisdom.

*August 5*—Had a long conversation with Moselekatse to-day. I had before handed to him some tin vessels I had made, which he admired, and no doubt viewed me as a perfect genius of a tinker. I had before conversed with him about Livingston, and now stated plainly that it was my purpose to go to Sekeletu's country, or as near it as I could get, in order to hear if he had returned from the journey to the west coast, and to convey goods and letters I had brought for him. This resolution was to him like a dose of assafoetida; he replied that he was my son, and I must not leave him, especially as he was sick—that there was no one, even among his own people, whom he loved and confided in like myself, and he could not give his consent to my undertaking such a journey. He then began to number up bugbears, with the hope of frightening me: the fevers which pervaded all the rivers and swamps through which I must pass—crocodiles, and savage hordes. Putting on a very grave face, I said, "Moselekatse, Livingston is my child, and he is a servant of God; if I return without seeing him, or hearing certainly about him, I shall return with a heavy heart, and tell my friends Moselekatse does not love me." I added, that if he had any fears of my perishing on the road, I should leave a letter, which



he could send to the Kuruman, which would tell Mamele, as he called Mrs. Moffat, that it was entirely my own fault.

*August 6, Sabbath.*—Moselekatse, either sick or feigning to be so, did not make his appearance the whole day. Moselekatse knows, and some of his people know, that where the Gospel has been received, there is liberty of speech and action, and that where it prevails, it will oppose tyranny and despotism.

*August 16.*—Two young girls, about ten years of age, daughters of Moselekatse, of different mothers, came from a neighbouring town to see him, or rather me. He kissed each of them on the brow and then on each cheek. I observed others kiss them on each cheek, the brow, and chin. This seems to be the mode of Matebele kissing; it is done by men, too, when they meet after a long absence. The girls seemed the very picture of health; though they drank beer daily, their countenances exhibited great childish sweetness, while their bodies, well washed and anointed with oil, presented the most perfect female symmetry; but the women in general are no beauties.

*August 18.*—Moselekatse said, that as he had sent men to inquire respecting the road, and as they would go till they could learn something about Livingston, he would wish me to defer my journey till they had returned. Supposing this to be a plan, like others, to prolong my stay, I could not agree, especially as the hot weather would soon commence, and the rainy season in the month of October, which would render travelling in a country like this next to impossible. He showed me a number of elephants' tusks, which he said he intended to present to me as a token of the gratitude he felt for the kindness he had received from me since he first knew me. I replied, that though I could fully appreciate his kind intentions, I felt I could not accept of anything of the kind till I should have accomplished my purpose in getting Livingston's goods, &c., conveyed to him, and, if it were possible, seeing him myself. I added, that if he aided me in this undertaking, I should esteem his help more valuable than his present, and that I should be more ready to make him a present than to receive one, and then I should return to the Kuruman rich without a single tusk. These remarks made him look unusually grave, and, after a pause, he said, "Verily you love Livingston, and you love me too;" and, taking me by the hand, said, "You shall go." I snapped my fingers in Matebelian fashion, and thanked him with all my heart.

*August 22.*—This morning, when about to start in search of Livingston, Moselekatse got into my waggon, followed by some parcels of presents which he had received from one and another, and were deposited within. He sat down very composedly, and requested that the waggons might start. I supposed he was intending to go only to the next town, as he was followed by

most of the men, some of them rather too advanced in years to proceed far. Bidding adieu to my kind-hearted fellow-traveller—who would have been happy to accompany me, but, being in partnership with Mr. Chapman, felt it his duty to remain a while longer—away we went, with about 100 men and nearly half that number of dogs, large and small. Passing the first town without halting, we came to a pass between two hills, commanding a beautiful and rather extensive view. Here we halted under an ancient sycamore till the chief's own waggon, which he had sent for, should arrive. To my surprise the waggon no sooner arrived, than he requested that we should proceed to where there were bushes and firewood. On its joining us we again set off—his sable majesty keeping possession of my bed or stretcher, which, by its creaking, gave token that it had got an unusual load. After winding through considerable thickets along the base of hills, we descended into a pretty valley, where was every requisite for a comfortable bivouac. During the last two hours we have been followed by some carrying carosses, others food, and about twenty women with large calabashes of beer on their heads. Moselekatse's waggon being placed alongside of mine, the people then, as at every halting-place during the journey, commenced hewing and tearing down branches from trees, principally evergreens. Of these, very commodious booths were formed in all directions, leaving an open space in the centre for the cattle to sleep in. On the left of my waggon is a booth for my four men, in which Moselekatse chooses to sleep, and not in his waggon, or among his own people. To the right of my waggon is what may be called a royal pavilion of evergreens, where he sometimes sits, and his personal attendants repose. Immediately in front of my waggon is another large circular fence, where there are about nine of his wives, and twenty other women—beer-carriers. Several large companies occupy other portions of the encampment, which, lighted up by the blazing fires, presents an animated spectacle. Before dark a troop of fat cattle were brought, of which two were slaughtered, and strips of meat now garnish the live coals at every fireplace; and if human masticators are busy, tongues are performing their part to some purpose, which never seems to incommode the sovereign of all, who walks about evidently much pleased.

*August 25.*—This morning the camp was early on the march, and about noon we halted at a fountain called Pocheng. The country undulating, and scenery fine. Experienced some difficulty in getting over deep gullies, washed out by periodical torrents, laying bare sandstone and slate, while some of the neighbouring hills seemed to be composed of quartz, sandstone, and, when they were flat, covered with rich soil. We passed over



some miles of black deep ground, everywhere covered with cracks, some of them of great depth, and the whole scattered over with round stones about the size of a man's head, which made the ride most uncomfortable. Moselekatse, though sitting on a cushion, did not relish it till I told him that it was good for his health. Of course his doctors had never prescribed such a regimen. This evening the wind became very strong, which is frequently the case in this country, and though the earth is as iron, no rain having fallen during the winter, everything in the morning is wet with dew.

*August 26.*—After leaving Pocheng we passed some fine scenery, where elephants had been roving about a short time before, though, during the winter, they generally retire northward to the Tsétse country, where there are said to be immense herds. After a rather long and laborious ride, for the day was warm, we halted at 3 p.m. at a small rivulet which falls into the Mkosa river. All were immediately crashing among the trees to raise sheds for the night. Moselekatse came and joined me at a cup of coffee. He appeared in a very talkative mood, referred to the Boers as a barrier to his visiting the Kuruman; that he would consider it the happiest event in his life if he could but visit it.

*August 28.*—Moselekatse, during the day, sat a considerable time on my bed (his usual place) with his back to the front of the waggon. The country rather more open, with level valleys, which, during the summer rains, must be swamps productive of malaria.

*September 1.*—Having rested yesterday, and all having feasted, we crossed the river Kame, and proceeded in a south-westerly direction. The road, at least most of it, lay along a descent from heights to the left, over hollows and gullies, the worst we had seen. They consisted of masses of black basalt, covered over with quartz, of almost every colour and of all sizes. They looked as if some hill had been smashed to atoms and scattered regularly over the black surface, on which herbage was thin and trees spare and stunted. Everything like dust or soil had been for ages washed down towards the river. The road for a great distance was so sharp that our oxen could with great difficulty creep along. After crossing the ridge we passed over a flat country, which, during the summer rains, would be impassable for travellers with a waggon. We reached the Mapu river, the bed of which was 60 yards wide, covered with granitic sand, and which must come from the country over which I travelled, from the Shashe river to Matlokotloko river. The Kame river takes its rise south-east a little beyond that place, where there is no granite, and therefore the entire absence of sand in its bed. We were met by some thirty women carrying calabashes of beer from a distance of 12 and 14 miles. A light rain compelled every one to seek shelter, and

during the night it was sweet to listen to the notes of the turtle-dove, which abounds here, and from which, doubtless, the river Mapu derives its name.

*September 3.*—Our chief spent most of the day on the brow of a height behind our waggons; he appeared to be holding council. He sat alone in the middle, while about fifteen of his men sat at the distance of 2 yards to the right and left.

*September 4.*—Engaged from morning till 9 o'clock P.M. putting a new axle-tree to the waggon; never rested a minute till it was on its legs again. The iron-work was no easy matter—heating it in a common fire, and hammering it on a stone. I would have given anything for a small portable smith's bellows, which travellers in a country like this ought to have. Having drunk nothing but sour milk during the day, Moselekatse sent me, on hearing the work was finished, a made-up dish of entrails, &c., swimming in fat, telling me to eat heartily as I had been working hard. Leaving these delicacies to others, I enjoyed a cup of tea.

*September 5.*—A very windy, cold day, with a little rain, driving every one to the fire and to shelter. More oxen than usual have been slaughtered. Beef is the standing dish, with sometimes additions of mutton and goat, stewed pumpkin and maize; the last, though boiled, requires hard mastication, as it is neither pounded nor ground.

Though we have been descending ever since we left Matlokotloko, we seem to be approaching a drier country; the soil lighter and more sandy, though the extensive valleys appear subject to being flooded during summer rains. On this account the higher ground is selected for the sites of towns and cattle outposts. The sandy bed of the river contains abundance of water where we are; but at this season it is lost at no great distance in the many branches into which the river divides. In many places, on higher levels, over which we passed during the last two days, limestone was seen attached to the roots of the trees, which roots had been torn up by elephants. The country here appears to be their summer pasture-ground. When they come in contact with gardens they make terrible havoc, notwithstanding the endeavours to drive them away. This is the country for the larger game. The elephant, giraffe, rhinoceros, elk, and buffalo abound here, and still more towards the north. Between this and the Zambesi there must be enormous herds. The luxuriance of everything in this country, for hundreds of miles round, would authorise any one to believe it capable of supporting an inconceivable number of such quadrupeds, and human inhabitants too, even were they increased one hundredfold.

*September 7.*—The summer has appeared these two days to be advancing with rapid strides. The sun to-day was burning hot,



and the tall thick grass having been lately swept off by fire there is scarcely a blade left for the poor oxen. These sweeping fires, which, if the wind be strong, pass through the country with fearful velocity, must necessarily destroy millions of insects, which accounts for their scarcity. The same may be said of birds; for such is the vehemence and height of the flames in many places that the tallest evergreens and other forest trees are scorched to their very tops. Occasionally the remains of a large species of tortoise are found, and more rarely those of the serpent, which can more readily escape from the fiery storm. The river, which we left this forenoon, we again approached about sunset. Where we crossed it was 150 yards wide, and consisted of deep sand, besides a heavy bank of the same on the other side. Being the only place where the descent was easy, we made the attempt to plough across; wheels immersed 18 inches. My waggon had no sooner reached the sand than it became a fixture. It was in vain to try and force the oxen to pull it a single yard. Moselekatse, who as usual sat in the waggon, on seeing this, gave orders to unyoke the oxen and call the soldiers, who instantly laid down their shields, and, as many as could, laid hold of the yokes, and away they went with a song, the waggon ploughing the deep sand, while Moselekatse sat enjoying the fun, and calling out *reke* in imitation of the Dutch word *trek* (pull). When they came to the opposite sand-bank I felt sure the waggon would stand. They only halted a minute to breathe, when up they went, and then ran off to the shelter of some trees. They then returned and brought the other waggon to the same place. While looking at the achievement, it occurred to me that it would be rather a striking picture to see a number of nearly naked savages dragging a missionary's waggon through a broad river—not of water, but of sand. As usual, booths were raised and cattle slaughtered, while strings of women overtook us, whom we had left at some cattle outposts behind.

September 9.—After passing half the night meditating plans, I got up and found our governor in excellent spirits. When I asked him what he thought we were to do, "Let us go on," was the reply. While we were sitting together, eating a royal dish of meat—paunch cooked with fat, not invitingly clean, but such as travellers get accustomed to—the men who had been sent to ascertain the state of the country arrived. Their intelligence at once settled the point as to our advance. Water was not to be had for oxen until the fourth day, and then only amongst the Tsétse. We talked and reasoned long on the subject, till I asked the chief what he thought was best to be done. He replied, "I am here to serve you; you must say what you wish, and I shall do it or order it." The idea of sending men with Livingston's goods at that moment struck me, on which I inquired how far it was to Linyanti; and if

messengers were sent, when would they return; or, if I were to go on foot, how long should I be absent? "Twenty or thirty days" was the reply; and if to the Barotse country, where Sekeletu might be, it would be a much longer time." I rose, and said, "I must think alone," and I should tell him the result of my cogitations. I soon after received the same testimony from William, and another individual upon whose word I could rely; for I knew well that if Moselekatse said Linyanti was just three steps on the other side of the moon, all his people would say so too. I returned to Moselekatse and proposed to go on foot if he would give me a certain number of his men. To this he would on no account agree; and declared that if I went he would go too, and would be carried when he could no longer walk. I then made the proposal that, if he would give me men sufficient to carry all Livingston's goods and papers to Linyanti, I should divide them into packages such as they could manage. To this he promptly agreed, and the next moment ordered a man to make a selection of individuals best acquainted with the country. The whole day was employed in making arrangements, and orders were given for twenty men and an officer to be in readiness. There were seventeen packages. The men, after hearing my instructions, repeated and re-repeated them, placed the bags, boxes, &c., some on their heads, others on their shoulders, and, taking their shields and spears, marched off. They were well supplied with food to enable them to pass through perhaps as wild and desolate a region as can well be found; to go through forests, over mountains and morasses to the country of those who are their enemies. No persons of any tribe with which I am acquainted would have dared to attempt such a thing. It is more than I had anticipated. Having thus done all in my power to supply the wants of Livingston, who doubtless will find all most acceptable should he be spared to receive them, I began to think how I could make the best of my time in the company of Moselekatse, who had given such unmistakeable proofs of his willingness to serve me. On the departure of the men, I turned to him and said, "How happy and how thankful I now feel! for with one word you have rolled off the big stone which lay on my heart." This remark made him smile and talk with unwonted cheerfulness. We soon inyoked and returned about 12 m. by the way we came. He remained with me at my waggon most of the evening, which afforded the opportunity of talking to him on the all-important subject of religion. He had heard me say that, but for the desire I felt to show him how grateful I was for his kindness, I should prefer taking a direct course homewards, instead of returning to Matloko, but that now I should return with him thither with all my heart. He remarked that he wished to show me still more kindness. I replied that the greatest kind-



ness he could now show was to allow me to deliver to him and his people the message of God, which was the great object I had in view in my present journey; that if he consented to this, I should desire nothing else. On hearing this he appeared thoughtful, stood up, and walked off to another part of the encampment.

*September 15.*—Yesterday we came by a much better and shorter way than that by which we went; halted in the evening at a very beautiful spot on the banks of the Kame. It was considerably below where we first crossed, and at the lower end of a long and deep pool, formed by a barrier of black basalt, of which the foundation of the country appears to be composed. Here more sea-cows were shot to-day, but at such a distance from the waggons that it made the day's hunt one of some labour. We had once and again to pass through the tracks of lions, which, however, did not seem inclined to trouble us, and we were still less inclined to disturb them, as there was room enough in that part of the world for us both. Two of the sea-cows seemed to be of a very great age. There were crocodiles at no great distance below our waggons, but they retired instead of approaching towards us.

*September 17. (Sabbath.)*—The master of ceremonies was half inclined to proceed yesterday; but from the state of my oxen, and the extreme heat of the day, I preferred remaining where we were. Though we had ample shade under the fine spreading Mopane trees, every one felt as if in an oven. To-day was still worse. As my waggon was, as usual, in the centre of the camp, amidst the babblings of nearly three hundred men and more than thirty women, all heathens of the first order, there was nothing to remind one of the sanctity of the day. No hush from earthly toil, no sound of church-going bell. After breakfast I directed my men to follow me to the shadow of some unbrageous trees, in the bed of the river, at a suitable distance from the noisy camp, where we might have our devotions undisturbed.

*September 21.*—After riding a short distance this morning, we halted at a town where the people, especially the women, appeared frantic with joy. They as usual came out with dance and song, just as Orientals do still. These are the congratulations of the women alone. The men that I have seen have their war-song, and dance apart. I never saw the sexes mingle as in Europe, nor anything like polkas, which would no doubt look rather barbarous in the eyes of the Matebele. Their songs must be sometimes extemporaneous, as I have heard my own name, and that of the Kuruman, repeated in their effusions, when they could not have had an hour's warning of my approach. During our short stay I walked through the town, which forms a circle, enclosing a large cattle-fold, like all Matebele towns. I observed some beautiful *Palma Christi* trees growing among the houses, affording a fine

shade. Moselekatse came and sat with me in the fore chest of my waggon. I told him I had just been visiting the chief man of the town, who was ill. As I knew this was nothing in his way, I added that I always felt happy in going to see sick people. While we were yet talking, the old chief, who was almost entirely lame in his left side, approached with apparently great pain, assisted by a long stick, and with a man behind him. He was tall, and had once been a strong man. On sitting down before the waggon, which required a painful effort, he raised his eye to Moselekatse, and shed a flood of tears. He sobbed and wept like one who had the tenderest of hearts. It was some time before he could repress his feelings so as to give expression to the pleasure he felt on seeing his sovereign, in whose service he had fought many a battle. Pointing to his paralyzed limbs, and looking up with adoration and cheeks wet with tears, and placing his hands on his heart, he said, "Though my body can no more fight the battles of the King of Kings, lion son of Machobane, this heart is still the same." Moselekatse looked at him attentively, and addressed him with considerable feeling. I observed that I liked to see such a manifestation of affection, and added, "That man evidently loves you with his whole heart, just in the same way we ought to love God."

*September 23.*—Yesterday I reached Babampeng, a town a short distance from Matlokotloko, and having sent a note immediately to Mr. Edwards, was glad to see him, waggon and all, after a few hours' ride. To-day I was engaged in making some arrangements in my waggon, and Moselekatse, fearing that I was making ready for my homeward journey, came, with some concern, telling me not to think of returning for some time, as he had sent for ivory to make purchases from Mr. Edwards, and as he had waited for me, I must wait for him. He also reminded me of what he little thought it was impossible for me to forget, that I must preach to his people. He doubtless hopes that this favour will go a great way in prolonging my stay among the Matebele. To-day the thermometer 94° in the coolest shade we could find, and 81° at bed-time.

*October 1.*—I had suggested on the preceding day the propriety of going over to Matlokotloko, and stopping there the remainder of the time I had to stay. When he heard this, he thought it was a step towards my departure for home, and said, "Do not think of going yet; you must preach the Word of God to my people, and you know how they like to hear you." I replied, that though I was gratified beyond measure at having had the opportunity, and felt deeply thankful for his kindness and for the trouble he had taken in the affair of Dr. Livingston, yet the season compelled me to hasten my departure in eight days; that



he knew that if the rains commenced as usual, I should have to walk home, and leave my waggon in the country; that he also saw, that owing to the bad pasture my oxen were very poor, and if rains fell they would die.' I concluded by remarking, that as he called me both father and mother, he must allow me to rule for once.

*October 2.*—Last night Moselekatse sat late at my fire, and would have sat later, but a thunderstorm drove each to his waggon. The shiver produced by a cold wind after a burning hot day has given me a severe cold. Moselekatse told some of his chief men that he would make rain and fill the rivers, and I should be obliged to remain. He saw it was cloudy and sultry, and thought the time favourable for making a display of his power, about which, probably, he is beginning to have his suspicions. However this may be, the people have their thoughts on the subject; for one of them whom he addressed told me that they now know, from what I had said, that he could not make rain; adding, "It is the moon in which rains generally commence, and if they do come, your waggons will sink everywhere." After Moselekatse had bartered a quantity of ivory with Mr. Edwards, we all inyoked, when he as usual took possession of his old berth, and appeared unusually cheerful. Before reaching the town the men struck up a fine air or march, which they sang with great enthusiasm till we entered the fold. Other martial airs were then sung, in which Moselekatse joined. This is the first thing of the kind since my arrival. There has been nothing of the gala days I was wont to see, because of the king's indisposition.

*October 5.*—These two last days I have been so feverish and hoarse as to be unable to hold Divine service, but had much conversation with Moselekatse. He sent a present of ivory, which he requested me to give to Mrs. Moffat as a gift from him to her, to whom he said he always felt grateful for having sent him presents of clothing and other articles long ago, which he greatly valued.

Moselekatse to-day, on calling me into his premises, showed me some ivory, and said, "That is for you; it is my present to you. I intended to have given you more, but it has not arrived." Observing me look like one taken by surprise, he continued, "I know you have not come for such things; but I give them as a token of the pleasure I have felt in your visit. I cannot forget you, and I wish you to remember me." I thanked him for his present; but his offer of cattle I begged to decline.

*October 9.*—Having got all ready, Moselekatse ordered an escort of men to conduct us as far as the Shashe river (150 miles distant), and another half-dozen of men were to accompany me till they were able to return with the report that my cough had left me. He ordered out two large elephant cow-tusks and one bull-tusk, a present for my men. Having gone out with us beyond the town,

he, apparently with great reluctance, stretched out his hand, and, taking mine, said with great emphasis, "May God take care of you on the road, and bring you safe to the Kuruman and to Ma-Mary, and tell her how glad I am that I have seen you." Having made a fair start, we proceeded to the Mohutse river, about 16 miles. 'Troi, a Griqua woman, having gone to bid farewell to her friends, overtook us soon after leaving.

October 25.—To-day we crossed the Shashe river, not of water, but of sand. We came by a more westerly road, altogether better and shorter than the one by which we went. Moselekatse, it appears, had given orders that our wants should be abundantly supplied, which orders were particularly attended to as far as Mahuku's village, where we first met one of the Matebele. Mr. Edwards also occasionally supplied us with game. Here our escort returned, and, in parting with us, exhibited as much feeling as if they had been near and dear relations.

Having left the Banguaketse on the 27th November, I spent the Sabbath among the Barolongs of Nyesa, an out-station of the French missionary at Motito, and arrived at Kuruman on the 8th December, with a thankful heart to the God of all my mercies. In the preceding pages it will be seen how far I succeeded in the objects I had in view when I undertook the journey. Although my health will never be what it has been, it has, with the exception of the affection in the head, been greatly improved.

I have just now learned, with thankfulness, that Livingston had, with extraordinary perseverance, reached St. Paul de Loanda, and was to return to Linyanti. It affords me no little gratification to see that I was directed by a wisdom, far other than that of man, in what I was able to accomplish on his account. If he be spared to return to Linyanti, he will have the satisfaction of receiving supplies for the outer, as well as the inner man.

As to whether the countries through which I have passed are likely soon to become fields for missionary operation, I am anything but sanguine. Of the willingness of the natives themselves to receive instruction no doubt need be entertained; but at present the prospect is anything but encouraging. Past events show to a demonstration that between the natives and the Transvaal Boers there can be no peace, until the former, as far as they can be reached, shall become the vassals of the latter, whose transactions have hitherto been characterised by a deep-rooted enmity to all missionary operations. To me the case appears more hopeless than ever, since the inhabitants of the Sovereignty, or Free State, have with heart and hand espoused the cause of the Transvaal Republic, and are lending their aid in the work of exterminating the Aborigines. If a road were opened up from Sebetuane's or Moselekatse's country to the E. coast, and permission obtained



there for free intercourse with the interior, a wide field would be opened for missionary enterprise. The Matebele having traded with Englishmen, who came up the Zambesi from the coast in boats, shows what could be done. Between the country of Moselekatse and the Zambesi there is, however, an insuperable barrier to travelling with either oxen or horses, on account of the Tsétse, so often referred to in these pages, and described by Livingston in his former journeys. They commence s. of the Limpopo river, run n. till near the Zambesi, and then stretch along, between that and the country which I traversed towards the country of Sebetuane. The Makalaka, Bakurutse, Mashona, Bacuabi, Masuase, Batonga, and other tribes, with whom I came into contact among the Matebele, did not appear to exhibit anything very savage in their disposition. It is the character of the Matebelan warfare, and the nature of their government, that make them a terror to the surrounding tribes. Nothing remains but to seek to reach the interior tribes by the e. or w. coast, and any missionary who has witnessed the deteriorating influence of a juxtaposition with the civilized communities would a thousand times prefer isolation, notwithstanding the difficulties it would involve in obtaining supplies. The most part of Moselekatse's country I should suppose to be healthy, especially the higher portion of it, principally of granite foundation. That the fever prevails in the more northern portions, especially in wet seasons, there is no doubt; but not with the virulence witnessed by Livingston farther to the n.w. On the whole the country is beautiful, and would present a rich treat to the geologist, as well as to the botanist—but how much more to the Christian missionary, with its numerous inhabitants, living and dying under a twofold tyranny!

*Kuruman, May 16th, 1855.*

I unfortunately discovered, after leaving home, that my sextant was injured to an extent I could not, in the absence of suitable tools, repair. On this account it was impossible for me to fix the latitude of any place, which I was exceedingly anxious to have done. I had thus no alternative but to take *bearings*, and lay down my course *by compass*. Even this was very difficult to accomplish with anything like precision, the country over which I traversed being either covered with forest, or presenting one labyrinth of mountains and hills. I had, therefore, often to have recourse to the direction pointed out by the natives, who are in general wonderfully correct. I drew out my course per compass, and distance travelled each day, or from one halting-place to another, with the course of the rivers. I then took the outline of Dr. Livingston's map south of the Zambesi, and laid down my route; but the distance between that river and the spot I reached does not agree, though the natives pointed to the Ngami Lake, w. by w.a.w. from the point from which I returned. In all probability the Botletle, or Masoë River, pointed out as falling into the Zambesi, and into which (the Masoë) the Nate, Kambe, and other rivers run, joins the Zambesi lower down than the sketch I made from information given by individuals who visited that





Map of  
SOUTHERN CENTRAL AFRICA

By  
James M<sup>c</sup>Queen Esq<sup>r</sup>.

• 18543





quarter while I was in the country. It is impossible for me to speak with any degree of certainty; but from the measurements I took with the trocheameter, and bearings, I should suspect that the Bamanguato, or Bakaa Hills, are laid down rather far to the north in Arrowsmith's map. Neither does the course of the Limpopo River, as laid down, agree with native testimony. I shall take the liberty of sending both sketches along with the Journal, to give you some idea of the country traversed. The sketches only commence at the Bamanguato town.

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X.—*Notes on the Geography of Central Africa, from the Researches of Livingston, Monteiro, Graça, and others.*

By JAMES MACQUEEN, Esq., F.R.G.S.

Read, December 10, 1855.

THE important and repeated journeys of our Medallist, the Rev. Dr. Livingston, of the London Missionary Society, in Southern Central Africa, have, as regards all that great and interesting portion of it, laid open in a generally correct form a large extent of Africa, which was only known to Europeans by uncertain and vague reports. The results of these laborious journeys have been of vast importance to Africa in particular, and to geographical knowledge in general. Having so many important points, and correctly fixed, it enables us to fix with tolerable accuracy several other places in Southern Central Africa of equal, if not of greater value to the world.

To no one in modern times have this country and the world been more indebted for geographical knowledge and researches than to Dr. Livingston. His labours and dangers have been great. They have been voluntarily undertaken, and have cost no country, and more especially this country, anything; so different from the researches and labours of others. But it is to be hoped that this great country will not long allow him to go without a proper reward.

His journals, and the delineation of his journeys, are already before the world. These speak for themselves, and require no further elucidation here. They are, in their leading features, best pointed out by a reference to and inspection of the map accompanying this. It is to connect these with the generally correct information obtained from the journeys and labours of other African travellers that is my present object. To do this, it is necessary to glance generally, and as shortly as possible, at the information that has been obtained by the travellers after-mentioned, but little known to the public in general, regarding the more eastern and central parts of Africa. The Society, as we proceed, will perceive by a reference to the map, the variety and importance of these, and how, when one part is correctly fixed, it invariably leads



to fixing other parts in their true position, or nearly in their true position, and to make that clear which was formerly doubtful, and which otherwise could not be safely determined.

The Leeambye is clearly the river previously heard of as the Cuama; the great southern branch of the river known in its lower course as the Zambesi. The cataract which was reported to exist in this branch of the river, a great distance in the interior, is now accurately ascertained and fixed. The very high lands which now form the southern bank of this river in its middle course, towards the source of the Manica, the rivers of Sofala and branches of the Limpopo, as stated by the early Portuguese authorities, and adopted by me in my map of 1840, are now well ascertained to exist. Mr. Moffat, in his late journey to Moselekatse, pointedly tells us that after passing the Sha'he, a branch of the Limpopo, the land became exceedingly mountainous as he approached the residence of that well-known African chief lately settled in this quarter, and at no great distance from the southern bank of the Leeambye or Zambesi. This is important. These mountains to the eastward of the residence of this chief (about 200 miles) are reported to be in some parts covered with snow.

Meeting the high lands mentioned, the river turns its course nearly N.E., and after passing Chicova runs a distance of probably 70 miles over rapids and cataracts, called Sacumbe, which render navigation almost impossible. Emerging from these, the river continues its course to the E., having above these parts, as we shall presently see, received the Zambesi and the Aroango from the N.; and thence pursues its way eastward by Teté, a mighty and important stream, being, at a short distance below that place, above half a mile broad, with a very rapid current.

The distance from Teté to Zumbo, at the junction of the Aroango with the Zambesi, has hitherto been erroneously stated from the careless manner in which the Portuguese accounts have been collected, and this too from imperfect translations. Neves, in his work of 1830, and others, give it the most correctly. He tells us that from Teté to the cataract or falls of Succumbe, in the Zambesi, is 30 leagues, from Sacumbe to Zumbo 28 leagues. This will place Sacumbe in  $31^{\circ} 20'$  E. long., and  $15^{\circ} 55'$  S. lat.; and Zumbo in about  $15^{\circ} 36'$  S. lat., and  $29^{\circ} 36'$  E. long. The river, according to Gamitto, above Teté descends from the north-westward. Zumbo was at one time an important Portuguese commercial station, to which gold from the rich mines of Abutua was brought, and ivory and other articles even from the Orange River. It is now nearly desolate, from the decay of the Portuguese power in this quarter, and from African wars and dissensions in the more interior parts.

The high lands in Southern Tropical Africa which separate the

waters which flow westward into the Atlantic Ocean, and eastward into the Indian Sea, were stated by actual observation by the Hungarian officer, Ladislans Amerigo, in 1851, to be in  $10^{\circ} 6'$  s. lat., and  $21^{\circ} 19'$  E. long. Dr. Livingston more fully and precisely confirms this; so also were those laid down in my map of 1840, after a rigid research amidst the best authorities I could then find.

But before proceeding to enter upon the description and delineation of some of the rivers which flow eastward from this point of Africa, the chief object of this paper, it becomes necessary to turn for a moment to the consideration of the rivers and countries much more to the eastward, to show what has been examined and described in those parts by late accurate travellers, late at least as far as Western Europe knows them. This will enable us to see the value and importance of their geographical researches and discoveries, and fix some of those more exactly than could otherwise have been done. The great importance of Dr. Livingston's discoveries, and others to which I am about to draw the attention of this Society, will thus become more apparent.

The three best of these authorities which it is here considered necessary to notice, are, *first*, Dr. Lacerda, a scientific man, who was despatched by the Portuguese Government on a special mission from Mozambique to Cazembe, in 1797. *Second*, Pedro de Baptista, a Portuguese, and servant to a Portuguese merchant, who in a trading journey crossed the country from Angola to Teté, and returned safe, between the years 1806 and 1811. His journeys are very valuable, as every day's march is carefully noted, as also the number of hours travelled each day. In the eastern part this accuracy is established by Dr. Lacerda's astronomical observations. *Third*, we have the narrative of the diplomatic mission despatched by the Portuguese Government from Teté to Cazembe in 1830-1832, only published this year at Lisbon, and received in this country a few months ago. Of these the latter is most diffuse, entering minutely into everything that the conductors, Major Monteiro and Captain Gamitto, saw or heard of these countries; but Dr. Lacerda's is the most useful, from the few important astronomical observations it contains. The Doctor died immediately after he had reached Lucenda, or Lunda, the capital of Cazembe, and hence the position of that important place has not been exactly ascertained; but as Monteiro and Gamitto give us the bearing and distance travelled every day throughout their whole journey, we cannot err far in fixing the position of Lunda by their bearings and distances, starting from the point of Lacerda's last observation. All three travellers went over nearly the same ground, from Teté to Cazembe. Where Monteiro and his attendants deviated occasionally from the track of the others, they



took in, and reached, and stopped at all the same important places noted by the former.

The position of Teté as taken is sufficiently accurate. It is a little (*see* P.S.) to the eastward of Mazavamba, which latter is two days' journey distant from the Aroango of the *n.*, there being some smaller streams of that name much more to the *s.* At Mazavamba, Dr. Lacerda made his observation  $12^{\circ} 33'$  *s.* lat., and  $41^{\circ} 26' 30''$  *E.* long. of Lisbon,  $32^{\circ} 18' 30''$  *E.* of Greenwich. At Muíro Achinto he took another, namely  $10^{\circ} 20' 35''$  *s.* lat. and  $39^{\circ} 10'$  *E.* long. from Lisbon,  $30^{\circ} 2'$  *E.* of Greenwich. Taking Monteiro's bearings and distances from hence, we have the true bearing *N.*  $27^{\circ}$  *W.*, and the distance made good 150 m. This brings Lucenda or Lunda, the old capital of Cazembe, to be in  $8^{\circ} 15'$  *s.* lat. and  $29^{\circ}$  *E.* long.; but this may properly and probably fairly be corrected thus: the observations made at Sena by British officers, make Sena 30' more to the *E.* than Lacerda has made it, very likely from the greater accuracy of their instruments. Assuming that the other observations made by Lacerda should to this extent be corrected, it would make the other two places mentioned 30' each more to the *W.*, and Lucenda thus in  $29^{\circ}$  *E.* long. and  $8^{\circ} 10'$  *s.* lat., and so I have taken them.

The Society will presently see the vast importance of these facts, and the others about to be stated: to both I have to beg their particular attention. From Teté to the Aroango, all the travellers, but especially Gamitto, tell us that the land is very mountainous. The Sierras rise to a great height, yet the country is fruitful and very populous. From R. Bua to Sierra Capire, the streams crossed run to the eastward and to the Chire, but all the others run *W.* and *S.* to the Aroango and the Zambesi. Beyond the Aroango about 30 miles is the Sierra Maxenga, which rises to the height of nearly 17,000 feet above the level of the sea. From this point, where crossed by Monteiro, it ran on the one hand *N.E.* (a branch also running *W.*) and on the other hand it stretched away *S.* to the Zumbo and Island, where the Aroango meets the Zambesi, dividing both to the *S.* and to the *N.* the valley of the Zambesi and the Aroango. From Zumbo on the *S.*, an inspection of the map will show that the chain runs still farther *S.* to the chain of high land in the kingdom of Chidama, belonging to the great empire of Monomotapa; thence it runs southwards to the Dragenberg mountains, near a spur of which, at the junction of the Likua and the Elephant Rivers, the hills on their *W.* side rise above the limits of snow. To the *N.N.* the ridges run to the high lands which bound the Lake N'yassa, as it is called, to the *S.*, in which are the sources of the Zambesi, the Aroango, and the Chire, or Xire, or Luaba, and also the River of Mozambique.

From the summit of the Sierra Maxenga the view is most beau-

tiful and extensive, to the N.W. bounded by the horizon only. The land thence, almost to Cazembe, is generally level, with only a few dwarf shrubs upon it, and a very scanty population. Through these levels the numerous streams hold their sluggish course, and are so tortuous that the traveller crosses and recrosses the stream, increased or diminished according to his course, without his knowing or suspecting that it is the same river, and sometimes the same river under a different name. I shall not fatigue the Society by dwelling more largely on this point. From the Arroango to Sierra Maxenga the country is inhabited by the Cheva nation or tribe, and from the Sierra Maxenga to within a short distance of Lunda it is inhabited by the Movizas, partly an agricultural, yet more inclining to be a pastoral, but generally an indolent and careless people. The travellers found on either hand several lakes, some greater, some smaller, the remains probably of the waters of the inundation. The vast plains of level country already mentioned are here and there studded with fine, but insulated clumps of trees, each where they appear rising like a beautiful green island in the midst of the ocean.

Let us next attend to the important point, namely, the magnitude of the principal rivers where the travellers crossed them; this considered will give us reasonable data to determine the distance to their respective sources. Where Monteiro and his party crossed the Arroango in their advance at some distance below where Pedro and Lacerda crossed it, they found the bed of the stream 150 fathoms broad, the banks 12 fathoms high, the water then occupying two thirds of the breadth of the bed, and the depth  $3\frac{1}{2}$  feet, with a swift current. This was in the beginning of September, the end of their dry season. It overflows its banks during the rains. It runs W. and then S., and joins the Zambesi at an island near the Zumbo station, calculated to be 70 leagues, or 210 m. distant. In his advance Lacerda found this river, August 25th (the dry season), 18 fathoms broad, and depth 2 feet 9 inches. It joins the Zambesi, he says, at the village of Zumbo, founded at the confluence. Pedro, in his advance (the wet season) to Teté, found the river 30 fathoms broad. The Doença and the Pamasi, both large streams, join it a little below this point, and at short distances on its W. side. Next let us take the Zambesi; Gamitto found it, below where Lacerda crossed it, 80 fathoms broad, banks 5 fathoms high, and depth  $3\frac{1}{2}$  feet (dry season September), and with a very rapid current (the country hilly), equal to 9 m. per hour. Many shell-fish on its shores. Lacerda, in his advance (the dry season, September), found this river 25 fathoms broad, nearly 4 feet deep. Pedro, in his advance to Teté, does not give the magnitude of this river, though one, the Lumbahenge, he says, was in depth, the water up to the breast.



He calls the Zambesi, the Hianbeje, or the Diambeje of later travellers. On his return Monteiro found the Zambesi, or as he calls it, the Chambeze, 100 fathoms broad (country become plain) and 34 feet deep, with a very rapid current. This point was about 65 m. to the westward, being 20 m. to the southward, of the parallel where he first crossed it; both times were in the dry season. The course of the river here was thus about s.w. by w. This river cannot, as has been supposed, join the Luapula, because where Pedro crossed the latter, 210 m. distant, it was, and in the rainy season, only 340 feet broad.

There are, it may be observed, some rivers which run between the Zambesi and Lucenda, taking a northern course. The Luapula, which flows N.E. to the westward of Lucenda, is 55 m. to the s., about 50 fathoms broad, and so deep that it could not be forded. Lucenda is situated on the N. side of the river or lake Mouro or Mofo, about 10 m. broad, supplied by the river Canengoa, a small stream, about 20 ft. broad, which bounds the capital on its w. side, and afterwards, together with the river Lundo, joins the Luapula, or, as Gamitto calls it, the Guapula. The termination of these rivers was left doubtful. The Portuguese about Teté and these parts were inclined to consider them as the head-waters of the Chire. Lacerda's death, no doubt, prevented him from ascertaining this point. It is impossible that any of them can run to the Chire. A glance at the map and the position of the high land to the s. of Lake N'yassa will settle that point. Happily, I think, the matter is no longer left in doubt. The Arabs in the East, who visit all these places in the interior, have long told us that the waters of the rivers, such as the Luffia, that enter the sea to the s. of Zanzibar, rise far inland to the s.w. of Lake N'yassa, and come, such as the Luffia, from a large lake in the interior. Major Monteiro clears up the point by stating that they go, some to the Nhanja Grande and to the Indian Ocean by the Cuavo, or some other stream. He has, in his volume, edited, I believe, by Viscount Sa da Bandeira, stated several things which settle the point more decidedly than he had any idea of. There we learn that the word Nhanja is applied to either lake or river; that there is in the interior, and much to the N. of Cazembe, first, a Nhanja Mucuro Grande, or Great River, and next, the Nhanja Piqueno, or Little. The Great Nhanja, he says, is 9 leagues (30 geographical miles) broad; that it takes three days by a canoe to pass it, stopping two nights on the islands in it, and reaching the opposite shore on the third day. He further says that the current easterly is so strong that the canoes used in crossing it are compelled to pull in an oblique direction to enable them to pass. From his stating that the easterly current retards them, it is evident that he refers to parties passing

from the east shore to the west. Here we have a complete and satisfactory explanation of the information obtained by the Rev. Mr. Erhardt, and communicated to the Society at their last meeting, as to the Great Nienda on the *N.* and the Little Nienda on the *S.*; clearly corruptions of the word "Nhanja," or else the word "Nhanja" of it. He (Mr. Erhardt) says also that the Wavua or Vavua, who dwell about the sources of the Aroango, as they really do (see place on map), and who are great traders, and take trading journeys, of some months' duration, to the country of Monomoi, pass, on their way to it and the Great "Nienda," the rivers Murusura and Ruapura (Luapula), both of which run to the *N.E.* to the Indian Ocean. A glance at the map will show that in their journey they must cross both these rivers on their way to the large lake, and this, I think, decides the point that there are two separate and distinct lakes, namely, the Great and Little Nhanja, or "Nienda," as the Portuguese state and Mr. Erhardt has heard. This is very important, and, in my opinion, satisfactory, and leaves no room for any further doubt.

The magnitude of the rivers just mentioned, and at the season of the year stated, namely, the season before they become flooded, shows that we must look for their affluents at a considerable distance to the northward. Their affluents, it is clear, especially from the eastward, as relates to the Aroango, cannot be very numerous or important. The body of water in the Aroango was 20 fathoms broader than in the Zambesi, but then the current of the former was only about 3 or 4 miles per hour, while that of the latter was estimated to be 9 miles per hour. Now the quantity of water passing through any given space is as the square of the velocity. Both rivers were of the same depth. Hence the square of the velocity of the Aroango, say 4 miles per hour, is 16, but that of the Zambesi is 81; showing that it is much the larger stream, and that its sources must either be more remote, or that it must have a greater number of affluents. This latter the features of the adjacent country can scarcely allow to any great extent. Moreover, the river Ruanceze, about 11 m. *S.W.* of the Zambesi, joins the latter river a little to the *S.S.W.* It was 120 ft. broad, and, according to Lacerda, was deeper than the Zambesi. Lower down, the Ruanceze was 68 ft. broad and 15 ft. deep, the current south. Therefore its sources must be sought for in those high lands which bound the lake, hitherto known as or called N'yassa, on the *S.*, between which and the sources of these rivers no river can pass to the eastward, either to form the Chire or any other river in that direction. The position assigned to their sources therefore cannot be materially wrong,—at least 130 to 150 miles distant.



It may not be out of place here to remark that the Bashukolompo, mentioned by Dr. Livingston as 30 days' journey (230 or 300 miles) eastward from Shesheke's town on the Leeambye, may be the Zambesi above-mentioned, in its southern course to the Cuama, the name of which the former takes and assumes as its own.

The positions of the important lakes in tropical Southern Africa, as here fixed, are the same as made out by me, more than ten years ago, from the information I had collected from authorities clearly deserving attention. The chief of these were, first, a journal of an Arab traveller or merchant into the interior from Zanzibar, obtained by an officer of the Indian Navy at Zanzibar, and given to me. This was the clearest and most important journey in these parts I ever met with; it was presented to the Society, and printed in their Journal, but, to my regret, on the map published in a following number, it was so placed as to make it tell a tale quite different to that which it really stated. Secondly, a journey of the same kind, which I obtained through the United States of America, from their Consul at Zanzibar; the errors contained in this were easily rectified: and thirdly, the different journeys into the interior, collected in Eastern Africa by those active and able men employed as Christian missionaries by the Church Missionary Society. There were many others; and from all these, carefully considered, the positions of the rivers and lakes in that portion of Africa, as now delineated, were placed. It is impossible for me, nor does it appear necessary in the present instance, to analyze all these, in order to show their discrepancies and agreements, and how easily, when all were carefully analyzed, they were reconciled. From a careful consideration of all these, the most northern part of the Great Lake is in about  $3^{\circ} 45'$  s. lat., and its centre in  $29^{\circ}$  E. long.; its most northern part is the exact number of days' journey from the point where the most northern route struck its shores; and so also of the distance around its northern shore to the entrance of the great river which joins it from the w., called in its upper course the Rovo, or Rofoo—the Luffia; its northern shore is thus in about  $3^{\circ} 45'$  s. lat., and its southern, say  $6^{\circ} 35'$ . The early Portuguese writers give no very inaccurate position to this lake, namely about E.S.E. from Fungeno, 42 days' journey distant. Dr. Krapf had heard that a large river issued from this lake, running westward (in this way native narrators often reverse the course of rivers), and by which he had at one time the intention to proceed, and to reach the Atlantic and Europe by the Congo. He would have found rivers running in that line, but in opposite directions.

Mount Kenia, the snow-covered mountain seen by Dr. Krapf, lies exactly under the Equator, and in  $35^{\circ}$  E. long. From thence

a range of very high hills rising above the line of perpetual congelation, and some of them volcanic, are to the westward, and their spurs approach to within a short distance of the northern shore of the great lake in question. Immediately to the north of Mount Kenia rises the most southern source of the Bahr el Abiad, the real Egyptian Nile; of this the information I have collected leaves no doubt. It is moreover in the very longitude where Ptolemy has placed it.

The lake in question has different names. It was well known to the early Portuguese discoverers on both the west and the east coasts. They, and in fact all accounts, placed it in the State of Mueno-Muge, but too much to the east, covering, as may be seen in De Lisle, from old Portuguese maps, a great portion of Africa to the northward and westward of Kilimanjaro. The Galla nation gave it more accurately, as being in the southern and south-western parts of their ancient extensive dominions, and held that it was so broad that it took a vulture three hours to fly across it. Well, allowing a little for their amplification, and that the three hours were only two and a half, and that the vulture sped at the rate of 60 m. per hour, that would give 150 m. for its breadth, which after all is no bad delineation for a Galla geographer.

Mueno-Muge, Mueno Muize, Monomoises, and Uniamese, relate to the same place and people, comprehending a large extent of country in the interior of Africa. The land on both sides of the lake is generally level and fertile, and the country pretty populous. From considerable research, and from the valuable work of Gamitto, I have ascertained the exact meaning of this and another African word, which clears up a good deal of African geography. The prefix Mono simply signifies great, lord or master; Muata has a similar signification, great, emperor, lord of, &c. Hence Monomoises means the great Moises or lord of the Moises or Movisas, while the Movisas or Moises which inhabit the country from the vicinity of the Aroango to near Cazembe are tribes of the same people. Hence also Monomotapa, the Great Motapa, and Muata Yanvo, the emperor of Yanvo, and Muata Cazembe, the emperor or lord of Cazembe.

There are few points in the interior geography of Africa better determined than the position of the Great Lake, and its distance from the sea-coast near Zanzibar. From an old friend, as has already been stated, an officer in the Indian navy, I several years ago received a manuscript, which he obtained at Zanzibar when there in an official character on an important mission. This paper contains the account of a journey made by Lief-Ben Said, an intelligent Arab trader, who, as leader of a caravan, had been twice at the Great Lake in the Monomoise country. Day by day his march is distinctly and clearly noted, describing the rivers



passed, and the nature of the country, hilly or level, with an account of the people who inhabit the districts and places that he passed through, with the distances in days' journeys carefully stated. He travelled at the rate of 9 or 10 m. each day; and it is well known that the daily rates of travelling by trading caravans in Africa are very regular, and scarcely ever vary. His caravan travelled, we shall assume, at the rate of  $8\frac{1}{2}$  geographical m. per day, the rate, or rather less than the rate, that it is found they travel in other quarters. With this scale, and his specific bearings, we have the following results:—

The caravan started from Boamy, or Boami, mentioned by Dr. Krapf, a village at the mouth of the river Pangany, situated on its southern side, and in the month of September, 1831, the dry season of that part of tropical Africa. Thence they marched nearly w.s.w. 21 days, but occupying one month of the whole journey. They travelled through a hilly country, and crossed the different rivers marked on the map, one of them, the Montanero, on the fifth day, 200 yards broad. At the end of 21 days they came to the Bahar, a word meaning either sea or river, but river as pre-eminent to others, and most probably the Luffia. At this point also they came to the great river Matoney, much infested with hippopotami. From this point they travelled constantly in the direction of the setting sun, that is, due west, and close to the north bank of the river, passing Powaga, Sanga, &c. This distance occupied 18 days (in this portion there is obviously an error of five, that number being twice stated instead of once—difference, say 45 m.), and in three more they came to Sanga, leaving the river Matoney on the left hand, and, be it remarked, the hills or hilly country on the south or left hand also. The country then became level, principally sand and ironstone. In 10 days more they came to Sangara, which forms the eastern limits of the Monomoi country. The districts through which they had passed were populous; and since leaving the coast they had had no rain. From thence to the lake the country belongs to the Monomoi tribe, which are under four independent sovereigns. The people are very honest, and civil to strangers. The road to the lake is plain, and without hills: the country is also very populous. From Sanga, in 18 days they came to Ogari, where there is a large river called Magrassie, having passed Gunda, Shisha Sanji, and Sangosi. From Ogari to the residence of the great sultan of Monomoi, through the country of Oha, is 12 days, which I consider not the time taken up in actual travelling, but the whole time occupied in passing, through this state. The number of days' journey actual travelling may be here taken at 5 or 6 days. The days actually travelled will stand thus:—

Boami to Bahar or River .. ..	21 days, 179 miles, s.e.w.
Bahar to Sanji .. ..	16 " 136 " w.
Sanga to Sangara .. ..	10 " 85 " w.
Sangara to Ogari .. ..	18 " 153 " w.
Ogari to capital on lake .. ..	6 " 51 " w.

Total .. .. 71 days, 604 m.

But 5 days, or 45 m., should probably be deducted.\* The whole journey occupied 140 days.

The people on the shores of the lake are as fair as the Abyssinians. The Monomoi country is about 2 months' journey from N. to S., and 1½ months' journey from E. to W. The lake at the capital is about the breadth of the channel between Zanzibar and the main land, or 24 m. He thinks the lake extends to the westward of S. There is, according to Gamitto, a strong current on the lake to the eastward. The inhabitants on the W. side of the lake are called Yoah, and are Mahommedans. The lake contains multitudes of fish. A great trade in cotton cloths, &c., is carried on from the western shores of the lake with the western coast of Africa, the journey to which occupies six months. There are many islands in the lake. The boats in it are long and narrow, and without sails. The shores are studded with sand hills, and there is a considerable sea or swell upon it, and its depth is represented to be considerable. The river Magrassie joins the river which has its origin in the lake.

The position of the Bahar and river Matoney will thus be in 6° 38' S. lat., and 36° 8' E. long. The position of the capital of Monomoi, and the eastern shore of the lake near its S. end, will be in 6° 34' S. lat., and the centre thereof in 29° E. long., and N. 31° E., or 120 miles, from the capital of Cazembe.† This may be assumed as its true position, and from thence it stretches away northward, inclining to the W. probably 180 m., its breadth increasing considerably, but the extent uncertain. The land around it everywhere is low, but beginning to rise from its northern shore till it becomes very mountainous as it nears the Equator.

With reference to these interior African lakes I have long held the opinion that they are in more instances than one merely the expansion of large rivers running through a level country during the inundation. Hence the discrepancy regarding their extent and position according to the season of the year, and the points and times at which native travellers reach them. I am now convinced that such is the fact. From the lat. of 3° S. to the lat. of 10° or 12° S., and from the long. of 34° E. to probably the long. of 25° E., Africa is a level country, deeply intersected by

\* See P.S. at page 127.

† See also P.S.



large streams, and widely inundated by the floods in those rivers during the time of the tropical rains, but leaving in many places lakes greater or smaller, as may be, in the dry season.

The smaller lake, situated to the *E.* and to the *S.*, is nearer the sea than has hitherto been supposed. Dr. Krapf told me that it was fourteen days' journey due west of Kilwa or Quiloa. This in African measurement is about 210 geographical miles. In this case its position, say the centre, would be in  $9^{\circ}$  *S.* lat., and  $35^{\circ} 20'$  *E.* long. It is surrounded by very high mountains on the *E.* and the *S.*, so high that it is said snow is to be found on the former. The lake lies on the western side of these mountains at some miles distance. A considerable river enters it from the *S.* It is doubtful if it communicates with the sea. Gamitto says that it does not. Hitherto it has been stated that the river Ruvuma issues from it, but I am satisfied that this statement is incorrect. If it has any outlet, the Cuavo is most likely its drain. The ancient name, Maravi, was probably given to it because the country known as Maravi formerly extended northwards to Cape Delgado, the lake forming its north-western boundary. The name N'yassa we now know to be incorrect. The journey of the Arabs across the continent settles that point, for we find N'yassa, or N'haça, is an extensive district running eastward from near the Aroango, through the country of the Tumbucas, eight days' journey to the *S.* and *S.E.* of Mavazamba in the direction of Mozambique. In this district we hear of no lakes, but some rivers. The district is represented as fifteen days' journey in extent, where every town is mentioned by the name N'haça through a distance of probably 260 m.

Gamitto has a remarkable passage where he states it is uncertain if his Nhanja Grande and Nhanja Pangono join, or are some days' journey distant from each other. His Pangono, clearly the river Pangany, is several days' journey distant from the Nhanja Grande (Great River), or Luffia.

Major Monteiro and Captain Gamitto have given us minute and valuable details regarding the manners, the customs, and character of the population of that part of Africa through which they travelled. They are interesting, and show a considerable degree of order and civilization. In Cazembe and the capital much order prevails. It is laid out in squares. Chiefs are appointed to almost every department necessary to be looked after. No one can interfere with the other, while all are amenable to the sovereign. Like the most civilized nations of Europe, they have regular markets, custom and excise-taxes, at the pleasure of the government, and rigidly exacted. When war arises they seize upon property, and tell the people that it is to preserve their liberties and to promote civilization. In this they are not much

behind Europe. The capital is a place of considerable size and population. The streets are broad, straight, and clean, and the houses circular, and, according to the representation given of them, rather neat and pleasing than otherwise. The most difficult thing the Muata has to contend with is, it would appear, to preserve and to secure the tranquillity of his numerous harem. But this is his own fault, by collecting so many females together. The man who has more wives than one at a time, will always and everywhere have, and justly too, the same difficulties to contend with.

The capital of Muata Hianvo, or Yanvo, is a point of considerable importance. On the accuracy of the point where it is fixed depends a good deal the correct geographical features of this portion of Tropical Africa. We have abundance of materials, but these are a good deal confused and unsatisfactory; we must wend our way through them in the best manner we can in order to approach to a satisfactory result. Dr. Livingston in his exploration supposes it to be in  $24^{\circ}$  E. long., and states that it is one month's journey, 300 m., from the ford of the \*Cassai or Loke. This would bring it to about  $6^{\circ} 30'$  S. lat. It is stated to lie N.E. and N.E. of Angola and Cassangé. Mr. Cooley has stated it to be N.E. Gamitto says that it lies W.S.W. of Cazembe, and the Moluanes N.W. of that place; and in another place he says that Muata Yanvo is N.W. of Cazembe. In Gamitto, p. 485, we find it stated that the capital of the real Muata Yanvo lies N.E. from Angola, and also in the Appendix, p. 486, that it is 52 days' journey beyond the Coango, viz. 7 days from the river to Manzaza, and 45 days from Manzaza to Muata Yanvo. Pedro Baptista gives us tolerably accurate information about it and its true position. It is only of late that we obtained an accurate account of his starting point, namely, the Fair of Mucary, which is about one day's journey E. of Pungo de Andongo, and on the Coanza. To it, according to the narrative of his journeys in the *Annaes Maritimos*, we find in No. 9, p. 425, that, returning, he travelled 30 days from Bomba, situated one day E. of the Coango. From Bomba, in his advance, he went 39 days by Moxica to Lunconquexia, the "mother" or chief of Moropo. From places in his journeys to the eastward, we find, from the points determined astronomically by Lacerda, that he travelled at the rate of 94 geographical m. per day. This last distance to Lunconquexia gives 370 m., and brings it to  $24^{\circ} 40'$  E. long., and about  $5^{\circ}$  S. lat. He makes no mention of any river passed in this distance, though there may be. It must be borne in mind that two native states in this portion of Africa were said to be governed, one by a male, the other by a female; the one 15 days' journey distant from and to the S. of the other. It would appear that Pedro proceeded from Lun-



conquexia to the capital of the other state. On his return from it (see No. 9, pp. 423, 424) he travelled 47 days, say 437 m., to Bomba, passing on the 22nd day the great river Cassais in a canoe, and in his course several other rivers. At the end of 33 days he came to the boundary of the territory of Muata Yanvo, and 14 days N.E. from Bomba. On his advance to Cazembe and Teté, Pedro travelled from the northern capital first 16 days, to Lunconquexia with the sun on his left hand, thus going due s., and next from Lunconquexia, or as he in No. 5, p. 170, calls it, Luncongucha (in No. 7, p. 282, he calls it Luconquessa), he travelled 20 days to Camoa in the same direction. From this place he turned eastward towards Cazembe, marching, as he says, with the sun in his face. The astronomical observations made by Lacerda enable us to ascertain his true bearings, namely, in the one case s., and in the other about S.E., and as carefully delineated in the map, as are also the rivers passed, and especially the most important of them, such as the Lualaba, Lubiry, &c. &c. The position of the northernmost state would thus be in  $24^{\circ} 30'$  E. long., and  $2^{\circ}$  S. lat.; and that of the other, in  $5^{\circ} 10'$  S. lat.

Major Ferreiro\* enumerates the rivers crossed between the Coango and the capital of Muata Yanvo, viz. the Luachama, Lombe, Quizemba, Luhi, Lueze, and the Lulua, which is the last, but he makes no mention of the Cassais or the Cassaby, nor do others. How then is the Cassaby to be placed? If it goes to, and is, as Graça and others state it to be, the river of Sena, it never can run to join the Coango. Of its most important affluent, the Lualaba, we have clear and satisfactory accounts, namely, that it is the boundary between the lands of Cazembe and its superior chief, Muata Hianvo, or Moluane, and that it in fact encompasses all the lands of Cazembe to the N.W. and N. This will give the Cassabe the direction that Ladislaus from ocular observation gave it, namely, to the N.E., and to the Indian Ocean, in which case it, or the united streams, must be a feeder of the Great Lake, Taganika, in the Monomoi country. It is remarkable that Graça states that the Cassabe comes from the N. In this case, the "Loké" of Livingston, may be a different river from the Cassabe. All these points require further research.

The jealousy of the chief of Cazembe prevented Monteiro and his fellows from visiting the Luapula, three days' journey distant, and a great Sierra, two days' journey more beyond that river, supposed to contain crystals and precious stones. After advancing two days they were compelled to return. In the account of places and countries to the north and west of Cazembe the narrative is deficient; this is much to be regretted. If they had been able to

\* See Gamitto, App. p. 485.

advance to any material distance from Lucenda, either to the north or to the west, they would have fixed distinctly some important points connected with the geography of this portion of Africa.

The sources of the Coango, and the west branch of the Leeambye and the Cassabe, have been fixed by the researches of Dr. Livingston. The magnitude of the united streams of the Leeambye and the Leeba (400 to 600 yards broad, and the Leeba singly 230 yards, in the rainy season) shows that the source of the former, before it is joined by the latter, must be distant, and runs perhaps to the distance and in the direction as delineated in the map. It is supposed, indeed it seems certain, that elevated or high land runs through the interior, from Sierra Maxenga on the east, to the sources of the Leeba and Coango on the west, dividing the waters that flow north-eastward from those that flow southward and south-westward. In these, and parallel with the springs of the Leeba, the Leeambye no doubt takes its rise.

Before turning to the consideration of the important river Cassabe, it is necessary to observe that there are two great empires in Northern-Central and Tropical Africa, namely, Muata Yanvo or Yambo, and Moropoa. The former contains no fewer than 26 provinces or states, amongst which are Cazembe and its vassal states. The great empire reaches south to about the tenth degree of s. lat. It lies about N.E. from Angola, and to the eastward of the Coango, in its upper and middle course. Cazembe and its vassals lie S.E. of its sovereign state. North of Muata Yanvo lies the territory of Moropoa, or, as it is sometimes pronounced by the Portuguese and natives, Molua, and its people, Moluas or Moluanes. It stretches north to the vicinity of the Equator, and comprehends several powerful provinces or states, and between it and Muata Yanvo there are frequent wars. The southern boundary of Moropoa is probably in about 5° s. lat.

And now to return to the river Cassaby, which has its source in the same high lands as the Coango and Leeba. Where Dr. Livingston crossed it at a ford, 11° 17' s. lat., he found the stream 120 yards broad (the middle of the wet season), and the current running N.E., afterwards, as he was informed, changing to E.N.E. He was also told by natives that it was an affluent of the Coango; but this is either a mistake, or the Casai, Kasye, or Loké of Livingston is a different river from the Cassaby, about to be considered. Regarding this we have two specific authorities, namely, the Hungarian officer Ladislaus, and J. Rodriguez Graça, a Portuguese merchant, who penetrated deeply into the continent and along this river in the years 1843 to 1847. Both travellers started from Bihé for their interior journeys. The first narrative of Ladislaus is so confused, that it is not possible to know, or to fix, exactly the rivers that he crossed in his more



northern route. After he had travelled 33 days, he reached the banks of the great river Cassaby-Kandal at Yah-Quilem, in long.  $23^{\circ} 43'$  E. The distance travelled would give  $10^{\circ} 30'$  S. lat. This is his statement, in a letter written to his father at that place. In the account which he gave of his travels when he returned to Benguela, as published in the official journal at that place, it is stated that he "penetrated to  $4^{\circ} 41'$  S. lat. and  $25^{\circ} 45'$  E. long. into the interior," from which it would appear that he travelled, perhaps descended, the river eastward to that point. He says, that in its onward course, it divides the secondary kingdoms of Lovar and Catema Cabito from the extensive empire of Lunda; and that after being joined by the great river Luloa (Lualaba) it changes its course to the N.E., is a league broad, and carries, or mixes its waters with the Indian Ocean in a part of the coast unknown to him. He further states, that the great rivers Lu-gebungo, Lutembo, Lume, Luena Quisomaje, and other great streams (navigable), are affluents of the great river Lecambye, or Zambesi, which enters the Indian Ocean at Quilimane. This is important and decided testimony, and is borne out by various other authorities. He calls it the enormous volume of water, and states that it rises in the high lands of Quiboque, where also the rivers Vendica, Cuiva, Cazeme, and Cambale take their rise. Not the slightest idea is by him expressed, that any of the great rivers that he mentions, run to the western coast, but quite the contrary. He must have been a long way into the interior, for on his return he states that he visited Quinhama (province of Lovar), where he met some Arabs, from whom he got a good map of the interior of Africa.

J. Rodriguez Graça, having reached Bihé from Loando, started from the latter place for the interior. Passing the Coanza on the 5th day from that part of Bihé whence he began his journey, he at the end of 12 days reached the southern boundary of Quioco or Quiboque, where he found the river Muangoa, which runs to the Cassabe beyond or to the north of the highlands mentioned by Dr. Livingston and Ladislaus. Previous to his reaching the Muangoa, he had crossed the rivers Cotia, Cuiva, &c., which join the Coanza in its right bank. From the southern boundary of Quioco to the point where he reached the Cassabe, he spent 15 days, 72 leagues or 240 m. distance travelled, but by no means that distance made good in the general bearing of his route. There is a great defect in Graça's narrative, where he gives us merely the distances and the names of some places and provinces; only in one or two instances he gives us the bearing of the Lulua or Lualaba, east from the Cassabe, previous to their junction in the province of Challa, 5 days before he came to the capital of Muata Yanvo. It is only by the names in a few places, and a reference

to the accounts given by other travellers, that we can trace, though by no means very accurately, the extent of his journey. The Lualaba, we know, bounds the territories of Cazembe Proper; and Cazembe, we are told, and I believe truly told, lies s.e. of the dominions of the sovereign power, Muata Yanvo. At the point where he first reached the Cassabe (June 16), the end of the wet season, he says, it was not possible to wade it. He takes it as a tributary to the river of Sena and the Zambesi, and states that it runs in all the territory of Muata Yanvo. He mentions that he encamped on the margin of the river the day after he reached it, in the great province of Catende, the chief of which lives on the margin of the river. In Dr. Livingston's map we find the village of Catende close upon the banks of the river, lat.  $11^{\circ} 26'$  s., and long.  $21^{\circ} 40'$  e. This may be the same place, but if so it scarcely gives his distance, nor does the depth correspond at that place, and at the point where he could not wade it. When Dr. Livingston crossed it, the middle of the wet season, it was only 120 yards broad: a small stream certainly it would become in the dry season. But Graça probably means that the great sovereign of Catende lived on the banks of the river, near to the point where he reached it, and to the n. of the village of Catende, which may have given the name to the kingdom. It is to the s.e. of Quioco, and is bounded to the s.w. by it. From the point where he could not wade the river he travelled principally along its banks  $36\frac{1}{2}$  days,  $162\frac{1}{2}$  leagues, 542 geographical miles, to the capital of Muata Yanvo; 15 days of this number he travelled along the right bank of the river, and at the end of 6 days he came near to the river Luana, a mighty river in the rainy season. At the end of 6 days he turned to the Cassabe again, and on the 3rd day he crossed the Cassabe, and marched along or near its banks, and on the 2nd day again crossed the river in the province of Difunda. On the 2nd day he marched e. and left the Cassabe on the left; on the 10th day thereafter he came to the margin of the river Lulua or Lualuba; on the 3rd day he encamped at the chief town of the great province of Challa, where the land is fertile, and agriculture carried on. In this province the mighty river Lulua joins the Cassabe; in 5 days more he reached the Banza, and chief town of Muata Yanvo on the 3rd September, 1846, and from which place he dated and transmitted his journal and communication to the Government of Angola on the 20th October, 1847.

I have been thus minute in the details of this journey in order to ascertain, as accurately as possible, the distance and direction travelled. He distinctly states that at his first point reached he found the river running eastward, under the impression that it formed the head waters of the Leeambye or Zambesi. But it



may be observed, that every river the Portuguese on or from the west coast saw or heard of running eastward in this portion of Africa, they always considered as belonging to the Zambesi of the east.

Ladislans does not tell us how the Cassaby-Kandal flows at his utmost point, but in his narrative, where all things are condensed by his copyist, he pointedly says that "the enormous bulky river Cassabe, in its course to the east, divides the kingdoms of Lobar and Catema Cabita from the extensive empire of Lunda (Muata Yanvo and Cazembe), where it unites with the river Lulua, changing its direction to N.E., and with a breadth of one league mixes its waters with the Indian Ocean in a place not yet known." The position of Lobar, pretty accurately known, and Yah-Quilem, sets the dubious point at rest. Again, Graça tells us that the Cassabe so traversed "springs" from the north; this river Ladislans reached in  $9^{\circ} 30'$  s. lat., and  $23^{\circ} 15'$  E. long., to the N.E. of the place where Dr. Livingston places the Cassabe, which is the name of a state as well as a river. Graça's travelling distances must be considerably reduced, including, as they do, turnings and windings, and bends of the river, and also as they appear to be excessive; for 6 and 8 Portuguese leagues (19 and 25 miles) in one day, is too much for African travelling, however unincumbered. This will bring his journey and distance into something like the shape which is here given to it. He tells us, moreover, that he reached the little river Luli, or Lueli, two days before he reached the Cassabe; and he distinctly informs us that the great river Lulua, or Lualaba, before its junction with the Cassaby, is found to the eastward of the latter. The reduced distance travelled by Graça (deducting *one-fourth*) would be about 800 miles in general and direct bearings. Two points appear sufficiently clear, namely, that the united streams of the Casaby, or Cassabe, and the Lulua, or Lualaba, unite in the province of Challa, belonging to the empire of Muata Yanvo, that their united stream bends its course N.E.; and it is remarkable that neither Ladislans nor Graça, at their extreme distances, heard anything of the Great Central Lake, which, had it been of the enormous magnitude that has been represented, could scarcely have escaped notice by some of the people, traders as they all are, who dwell in the extreme points that they reached.

It is obvious that all the travellers adverted to, consider that all the rivers of importance that they met with, in the interior, run to the east coast, both from what they themselves saw, and from information they obtained from the natives. There are also some more rivers crossed in his course northwards, or rivers that he heard of running westward, but the names of these are so blended together, that it is impossible to assign them a proper position.

We may, however, soon receive more accurate accounts of

these interior parts. The Portuguese now reign paramount at Cassangé, once the most powerful state in the interior of Africa. Three years ago, they, in the modern custom of spreading civilization, drove out one Jaga and appointed another, and at the same time concluded a treaty of peace and commerce with the great chief of Yanvo, by which they are to enjoy the privilege of trading in all his territories, and also through them with the states more to the eastward. It may also be hoped that the journey of Ladislaus complete, and also his Arab map of the interior, may yet appear. They are worth looking after.

*Postscript.*—Correcting Lacerda's longitudes as has been stated, Teté will stand in  $16^{\circ} 22'$  s. lat. and in  $33^{\circ}$  E. long. Lacerda places Maxenga in  $15^{\circ} 19' 15''$  s. lat. It is about 61 m. from Teté. Lacerda's course from Teté to Mazavumba was N.N.W., the average variation of compass  $22^{\circ} 24'$ . Teté is 24 journeys by the river from Sena.\* At 10 miles per day this would give 240 miles. Eleven days of this voyage are in the district of Teté.

It is also necessary here to observe that Gamitto places Zumbo at a considerably greater distance westward from Teté.† But he is certainly wrong, and has been misled by erroneous estimates of distances. This point, however, Dr. Livingston will soon enable us to determine accurately. With reference to the present residence of the African chief Moselekatse, Moffat tells us that it is 10 days' journey (say 85 m.) s. of the Zambesi, or  $19^{\circ} 21'$  s. lat. Its position in his rough map is considerably to the E. of the meridian of the cataract in the Zambesi. It will thus stand between  $27^{\circ}$  and  $28^{\circ}$  E. longitude, and distant from the Limpopo 220 m. due s. He says that after passing the Shashe the country became exceedingly mountainous. The Zambesi of the N. joins the Leeambye 60 or 70 miles above the junction of the Aroango of the S. with that river.

Since the preceding paper was written, at the close of last year, the author has received from Lisbon that excellent Portuguese periodical entitled '*Boletim e Annaes do Conselho Ultramarino*,' from its commencement to March 1856. Besides other amusing matter regarding Africa, it contains a full account of Graça's interesting journey and its objects, and also a more detailed and distinct account of the Northern journey of Ladislaus, with the abstract of his subsequent most important journey from Benguela to the S.E.—as far as lat.  $20^{\circ} 5'$  s. and long.  $22^{\circ} 40'$  E. The numbers also contain a very particular and remarkable account by B. J. Brochado of the Portuguese African settlements in Benguela,

\* See *Boletim e Annaes do Conselho Ultramarino*, No. 4, p. 33.

† See *Annaes*, No. 6, p. 54.



Bibé, and countries s.e. from it. These latter, according to the information Mr. Brochado had collected, agree with the subsequent account given by Ladislaus, of all that he saw and met with in his last journey.

Let us take Graga's narrative first in those points which tend to elucidate more clearly his important journey, simply premising or observing that its object was to persuade the native chiefs every where to relinquish the slave-trade and to betake themselves to cultivation and commerce. His advice and suggestions were met in a friendly spirit. From Gombe on the Coanza (the Coanza where crossed was 240 ft. broad and from 8 to 20 ft. deep), he was 28 days marching till he reached the banks of the Cassabe about Catende. Gombe also, he tells us, was the point where his and all other caravans commence their journey for Cassabe, Bunda, Lovar, Amboellos, &c. This at once gives us the direction in which he marched during this first part of his journey, namely  $N. 40^{\circ} E.$  From the point where he first reached the Cassabe he was 9 days till he reached the state of Cabango, on the banks of the little river Canhaje. This Cabango, probably the Cabango of Livingston, is distant 130 m. (geog.) from Catende, and through which State, namely Cabango, Dr. Livingston was told at Cabango that the river Cassabe flowed. Between Catende and Cabango they in one part (about half-way), left the Cassabe on the left hand. By doing this he must have been marching eastward. In like manner, when he crossed and recrossed the Cassabe at and below Sucumbuge, he must have been going to the eastward of  $N.$  Without this he could not have taken a course to the  $E.$  to reach the Lulua or Lualaba. After this and reaching Challa, we hear no more from him about the Cassabe. Had he marched north-west from the kingdom of Cabango 30 days (120 leagues) he would have come within a short distance of the junction of the Coango with the Zaire. Graga states pointedly (Annaes, No. 11, p. 157), that Cazembe is  $E.S.E.$  of the Banza of Muata Yanvo, which great State, he also says in the same page, is encompassed or surrounded by the very great river Cassabe, and which is exactly like the Lulua or Lualaba. Again in Annaes, No. 10, p. 123, he says that the Cassabe makes its way through the whole empire of Muata Hianvo.

In Annaes, No. 22, p. 238, of March, 1856, we have a more distinct account of the journey of Ladislaus in 1849-50 than the previous short abstracts which had been received had given us. In all the material points it is the same, but more specific. From the source of the Coanza, lat.  $15^{\circ} 9' S.$  and long.  $20^{\circ} E.$ , he marched  $E.N.E.$ , then  $E.$ , and then about  $N.$  till he came to the high dividing ridge in Quioco, lat.  $10^{\circ} 6' S.$  and long.  $21^{\circ} 19' E.$ , at an elevation of 5200 ft. He reached the banks of the Cassabe

in long.  $23^{\circ} 45'$  E., crossing the country near the sources of streams running to the Lecambye on the one hand and to the Cassabe on the other. He calls the latter a very mighty river, deep and turbulent, and says that after separating the kingdoms of Lovar and Catema-Cabeta from the extensive empire of Lunda, it changes its course more to the N.E., and being joined by the Lulua or Lualaba, the united stream, one league broad, pursues its way to the Indian Ocean at a point, to him, unknown. He penetrated to  $4^{\circ} 41'$  S. lat. and  $25^{\circ} 45'$  E. long., and visited places which he considered to be the heads of the streams which form the river Zambesi of Sena. He obtained an immense deal of important information regarding all these interior parts.

His second journey was equally important. From Benguela and Bibé he penetrated in a S.E. direction to  $20^{\circ} 5'$  S. lat. and  $22^{\circ} 40'$  E. long. through countries hitherto unknown, sterile and thinly peopled with tribes most barbarous and ferocious, the Mucancallas excepted, a distinct race and of more industrious habits. He dwelt nine months in the great province of Quinhama, situated between the Cunene and the Cubango, which latter river, larger than the Cunene, and rising in the same district of country, pursues its way to the S.E. In its middle course and near Derico or Indirico, it is joined by a large river called the Cuito, coming from the northward. The united stream pursues its way eastward ten days' journey from Mucago to the Riambege or Lecambye in the country of the Mococotas or Macololos. This is very curious and new, and is confirmed by the accounts collected by Brochada. The Cubango therefore must be the parent stream of the Chobe, and accounts for that immense flow of waters which in the rainy season Dr. Livingston tells us inundated the whole country round the Chobe, forming with the inundation of the Lecambye in 1854 a lake of near 120 miles in extent. Near Quinhama is Aimbiri, the Embarah of Dr. Livingston and the Bechuanas. Brochado says that the Riambege runs to the eastward deep into the interior, and that the banks of the Cubango are only cultivated in a narrow chain of small settlements, which supply the thin population with a scanty subsistence. There is no other river of any importance in the wide district mentioned, and whether the Teoghe is also a branch of the Cubango, is not stated, though, considering the level nature of the country, it is not improbable, especially during the rains. In referring to dates it appears that Ladislaus must, towards the end of his journey, have been at the time very near Dr. Livingston. He, at nearly his extreme southern point, heard of three Europeans who had come as far as the Muimbas and Moganguelas.

The great state of Quinhama begins about 15 leagues from the Cunene, and extends in the direction of S.E. 37 leagues. It is



a plain country without stones. The vegetation is good and abundant. In some places the soil is sandy. A full account of the journeys of Ladislaus accompanied by maps is in course of preparation for publication, and when they appear they cannot fail to be exceedingly interesting.

Adverting for a moment to the position of the great inland lake, it is proper to observe that in Lief-Ben-Said's narrative there is a discrepancy between the general summary of days travelled and that in the minute, or say daily enumeration. Which is right it is impossible to determine, but supposing the error to be in the latter, then four or five days or 40 miles in distance may be deducted. This will bring the capital of the Sultan to  $30^{\circ}$  e. long. and the centre of the lake so much more to the eastward. Thus placed, the capital will be 140 m. N.E. of Lucenda, the capital of Cazembe. Its length from N. to S. depends upon the accuracy with which the bearings in the northern and southern routes have been taken. The latter is considered sufficiently correct. The other, it is said, strikes the Lake about 8 days' journey from its extreme limit to the north.

The eastern source of the White Nile is, and from good information, in the position where I have placed it. Ptolemy places his western branch  $1^{\circ}$  more to the N. and  $8^{\circ}$  to the westward, and in this, from recent accounts and reports, there is good reason to believe that he is quite correct.

Although the interior of Southern Tropical Africa is generally a level country, still, in many places, it is mountainous. Where level it is an elevated table-land rising much above the level of the sea. As Lacerda approached Cazembe, he expresses his surprise at the degree of cold which he felt so near the Equator. In the vicinity of Cazembe there are several ridges of considerable elevation; around the sources of the Leeba, Coango, &c., the hills are high, and the country is generally mountainous along the Cassabe and Lulua. In Southern Benguela and Bihé the country is generally hilly. To the eastward of the Chobe and the Shaze it becomes very mountainous. From the Dragenberg mountains in the S. to the sources of the eastern branch of the White Nile in the N. an almost continuous chain of very high mountains are found. Round the sources of the Sofala and Manica rivers the country is extremely hilly. It is equally, if not more so, to the eastward of the Arroanga, and around its sources and along by Lake Maravi and Kilimanjaro. In the western portion round the sources of the Zaire and its tributaries, the country is certainly very hilly. In the district of Oholo or Holo to the west of the Coango, mountains are found rising to the height of 11,000 or 12,000 ft. above the level of the sea.

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XI.—*Notes of a Journey from Baghdad to Busrah, with Descriptions of several Chaldean Remains.\** By W. KENNETT LOFTUS, Esq.

Communicated by the EARL OF CLARENDON.

Read, March 10, 1856.

THE tract of country between the important cities of Baghdad and Busrah is thinly inhabited by a rude and almost savage race of nomad Arabs, who are continually at war with each other and with the Turkish authorities. It is also frequently overrun by plundering parties of the fierce Aneza and Shammar Bedouins, from the great western deserts. Hence it is that this portion of Mesopotamia is seldom traversed, except by messengers and others whom speed or positive necessity compels to adopt this line of route. The traveller usually proceeds by boat down the river Tigris.

A favourable opportunity, however, presented itself for passing through the region in question and for visiting several interesting ancient sites hitherto unknown or undescribed. In December, 1849, it was arranged that a detachment of Turkish cavalry—forming the escort of the commissioners appointed by the English, Russian, Turkish, and Persian governments for the demarkation of the Turko-Persian frontier—should leave Baghdad and travel by the most direct route to Busrah. Being anxious to make certain geological investigations in the deserts east of the Euphrates, I readily obtained permission to accompany the troops from Lieut.-Colonel W. F. Williams, n.a.,† the British commissioner, to whose party I was attached. Mr. H. A. Churchill was also allowed to accompany me; to this gentleman I am deeply indebted for the admirable drawings which illustrate the Memoir, and for the care taken in laying down the map from our joint observations.

Dec. 27, 1849.—The party set out from Baghdad early this morning, but we were disagreeably surprised to learn that our line of route had been altered. The troops had received orders to proceed from Hillah, along the western bank of the Euphrates, on account of the general insecurity of the country, and the difficulty of crossing the numerous water-courses in the Jezireh.‡ The road to Hillah, and the ruins of Babylon, have

\* The original memoir (with maps and drawings by Mr. Henry A. Churchill), together with the antiquities it was intended to illustrate, was deposited in the British Museum in 1851, whence it has been procured by permission of the Trustees.

† Now Major-General Sir W. Fenwick Williams, Bart., k.c.b., of Kara.

‡ Mesopotamia, being enclosed between the Tigris and Euphrates, is usually denominated the "Jezireh," or *Island*.



been so frequently described that it is unnecessary to dwell on this portion of our journey.

On reaching Hillah, we determined on carrying out our original design of proceeding through Mesopotamia. The Turkish officers of the escort and the authorities at Hillah made repeated efforts to dissuade us, by representing the Arabs as in a state of insurrection and the country as flooded with inundation. Finding, however, that our resolution was taken, they gave up the attempt, and Tahir Bey, the military governor of the place, ordered eight Bashi-Bazúks to accompany us to Abdi Pasha of Baghdad, who was then at Diwanieh, and to whom we were the bearers of despatches.

*Dec. 30.*—A heavy rain during the night delayed the appearance of our guards until 8 o'clock this morning. Having at length made a start and got clear of the date groves, we rode for  $2\frac{1}{2}$  miles nearly due E., across fallow land as far as the Werdieh Canal,<sup>1</sup> which is supplied with a considerable stream of water from the Euphrates, at a point midway between the Kasr mound at Babylon and the town of Hillah. For about a mile beyond this canal the ground was much inundated, and we were obliged to follow a very tortuous course in order to avoid the mud. From a ruined kala'at,<sup>2</sup> or fort, the general direction of the day's line of march was a few degrees S. of E. On our left, at the distance of about 4 miles, could be discerned the mounds along the course of the modern canal called Shat-el-Níl, running out into the desert S. of the conical Babylonian mound of El Hymar. The course of the ancient river of the same name, which flowed through Mesopotamia, carrying the water of the Euphrates to several important, but now deserted cities, was pointed out to me, bearing in a S.S.E. direction, about  $\frac{1}{2}$  m. W. of El Hymar. On the probable course of a branch from the ancient Níl I shall hereafter have to speak. At about 1 m. from the kala'at, the road traverses a low range of drifted sand-hills,<sup>3</sup> which bear S.E. probably 1 m., and S.W. out of sight. The width of this ridge is about  $1\frac{1}{2}$  m., and it is always altering in form, although continuing near the same locality. Mr. Ainsworth\* attributes the presence of these sand-drifts "to springs, which moisten the sand and cause its accumulation, allowing at the same time the prevalent winds to alter the form and number of the hills, while their bases have a fixed point of attraction." Such may undoubtedly be the case,

\* 'Researches in Assyria, Babylonia, and Chaldaea,' p. 117.

<sup>1</sup> Hillah minaret .. .. .	258 <sup>2</sup>
Babil mound .. .. .	327
Tomb and trees .. .. .	358
F. road .. .. .	151

<sup>2</sup> Hillah minaret .. .. .	372 <sup>3</sup>
Tomb and trees .. .. .	392
<sup>3</sup> B. to Kala'at .. .. .	279
F. road .. .. .	115

but I am disposed to believe that they are nothing more than ordinary sand-drifts. The decayed stumps of tamarisk bushes (*Tamarix orientalis*, Forskal) are constantly observed to be the nuclei around which drifting sand accumulates.\* Springs are, as far as I am aware, unknown in the deserts of Mesopotamia—wells, wherever they occur, being supplied by rain or inundation.

Beyond these ridges is the dry bed of an old canal,<sup>4</sup> on the farther side of which is a small mound covered with pottery, broken bricks, and glass. At 1 m. farther, the road skirts another little patch of drifted sand on the right; cultivation extended from it on our left. We here turned aside  $\frac{1}{2}$  m. from the road to visit a small mound called Sherifeh,<sup>5</sup> where an Arab tomb was being slowly built of coarse bricks dug from the surface of the mound. A large piece of basalt, which had been used at a recent date as a mill-stone, and a polished slab of scoria lying near, seemed to indicate a Babylonian origin to the site.

Our route now lay across a marshy piece of land for some distance. Two Arab tombs, Imáms A'oun and Reshid, directed our onward course. At 5 m. from Sherifeh mound, the Ba'ashíyeh Canal<sup>6</sup> crosses the path in a circuitous direction from the E. of Imám A'oun and its two date-trees on the right towards Imám Reshid on the left. It leaves the latter tomb on its N., and winds round to within 200 yards N. of the enclosed village<sup>7</sup> of Ba'ashíyeh,† which is reduced to three or four families. Judging from the number of ruined mud houses among the surrounding date groves, the village must formerly have contained a considerable population. To the S. of the canal is a tomb called Imám Khithr. I may here remark, that Imáms of this name are of constant occurrence in the desert, receiving their appellation from their locality near a solitary date-tree, or where the smallest spot of "verdure" enlivens the eye of the traveller wearied by the continual glare of the arid soil around him. At

\* Induced by my discoveries at Warka, Mr. Layard made an attempt to reach that ruin at the beginning of 1851. In his 'Nineveh and Babylon' he alludes, at p. 546, to these sand hills: "The sand issues from the earth like water from springs; and the Arabs call the sources Ayouan-er-remel (the sand-springs)."

† When I next visited this spot in January, 1854, a great change had taken place. The houses were nearly all covered up by sand drifts from the S.E., which were also burying the walls of the date groves, filling the water-courses, and destroying the date-trees. No drifts were visible in 1849.

El Hymar .. .. .	20°
B. to Kala'at .. .. .	231
N. extremity sands .. .. .	323
F. road .. .. .	109
El Hymar? .. .. .	13
Imám A'oun .. .. .	106

Imám A'oun .. .. .	202°
Reshid .. .. .	43
El Hymar .. .. .	322
Imám Derbash .. .. .	138
A'oun .. .. .	249
Reshid .. .. .	316



Ba'ashíyeh, where we halted for the night, deep wells afforded but indifferent water—the canal being dry.

*Dec. 31.*—On starting this morning we continued to follow the course of the canal, which is believed to be of ancient construction. The banks are very high. At that period of the year it was, as I have said, perfectly dry; but, on the rise of the Euphrates in March, it affords a plentiful supply of water for the irrigation of the land along its course. It was completely exhausted by its numerous offshoots before we reached the Gudús\* canal. This canal, also derived from the "Great River," crossed our road from the s.w.; it was without water, and said to be ancient.

We now traversed arable and pasture lands belonging to the Zobeid Arabs. They were well stocked with sheep and cattle. We passed close to the ruined Kala'at Wádi,<sup>9</sup> and Imám Derbash with its two date-trees. A few clumps of trees, on an easterly bend of the Euphrates, are visible at the distance of about 2 m.

At 5 m. from Ba'ashíyeh another dry canal<sup>10</sup> is crossed, which is called Awádíl from an Imám near it. On the left, at 4 m. distance, is Imám Abrag, and near it two or three small mounds.

Another tract of cultivated land, and a third patch of sand-drifts,<sup>11</sup> are succeeded by a bare desert soil. At 3 m. beyond Awádíl is the dry channel of a canal running E.S.E., which, from the size and height of its banks, must formerly have been of considerable importance. It is called Es-Sib.<sup>12</sup> Four Imáms, Ashjerí on the left, El Khithr, Abú Enkhala, and Abú Chef on the right, are visible from hence. We now came upon a vast space of inundated ground, where numerous ploughs, drawn by teams of cattle, were actively employed, presenting a scene of greater industry than is usually beheld in that slothful country. The water was derived from the Shúmelf canal, which, flowing from the Euphrates, is divided near Abú Chef into two branches. One of these, about 10 yards broad, takes an eastern course towards a new kala'at, distant somewhat less than 2 m. from the place of crossing. The other branch, flowing to the s.e., is lost, at about

* Ba'ashíyeh trees .. .. .	306°
Imám Derbash .. .. .	162
Kala'at Wadi .. .. .	156
Imám Awádíl .. .. .	137
" A'oun .. .. .	276
" Abrag .. .. .	102° 30'
<sup>9</sup> Imám Awádíl .. .. .	123
" Abrag .. .. .	89
Trees on Euphr. .. .. .	228
<sup>10</sup> I. Abrag .. .. .	75
Trees on Euphr. .. .. .	261

I. Awádíl .. .. .	154°
Kala'at Wadi .. .. .	301
<sup>11</sup> I. Abrag .. .. .	45
I. Awádíl .. .. .	317
I. El Khithr .. .. .	202
<sup>12</sup> I. Abrag .. .. .	26
I. El Khithr .. .. .	240
I. Abú Chef .. .. .	173
I. Abú Enkhala .. .. .	204
I. Ashjerí .. .. .	101

6 m. from the point of bifurcation, in an extensive inundation—as we observed upon the left of our onward journey. This latter branch<sup>12</sup> was crossed near the old Kala'at Shūmeli by means of a rude date-tree bridge erected for us in the course of a few minutes. This being one of the principal encamping-grounds of the Zobeid Arabs, numerous tents were clustered around the Kala'at.<sup>13</sup> To avoid the newly-irrigated land we were obliged to make a considerable détour so as to reach the large camp of Sheikh Molla A'li. The old man was too ill to receive us, but on sending in Tahir Bey's letter, with a request to be provided with proper guides, he promptly ordered a black slave and three other horsemen to accompany us.

About 2 m. from the camp we passed, on the right bank of the s. branch of the Shūmeli, the ruins of a large village enclosed with mud towers for defence. Soon after quitting it, the canal flowed towards the inundation on the E. We pursued our way for about 2 m. with the large mounds of the ancient Hourieh<sup>14</sup> canal on our right. It was crossed at a point where it could be traced until out of sight, bearing in a straight line 12° S. of E.

In the same direction we descried at a great distance the huge, ancient tower of unbaked brick, Zibliyah, shining distinctly in the last rays of the fast-setting sun. Dr. Ross of Baghdad and Mr. Baillie Fraser in 1834, and Sir H. Rawlinson and Mr. Hector in 1846, were the only persons who had succeeded in reaching it.\* Time and distance would not admit of our making the attempt to do so.

From the banks of the Hourieh towards the s. and w. there spreads out a vast uninterrupted plain of yellowish sandy soil. A clump of trees at Shkhiyer, in the s.e., alone breaks the dull uniformity of the horizon in that direction.

A farther ride of 5½ miles brought us to Imām Múserrethee, ¼ mile beyond which was the camp of Sheikh Saïd. For some reason unexplained our reception was not cordial. During the time we took shelter and warmed ourselves at the blazing fire in his huge black tent, while our own was being prepared, he addressed his conversation to his dependants with the most inhospitable rude-

\* Mr. Layard visited this ruin in 1851, and described it, *loc. cit.*, p. 369. I subsequently reached it in 1854, in company with Mr. Boucher and Mr. T. Ker Lynch of Baghdad. It is about 50 feet high, and 44 paces square at the base, which rests on a low brick mound, probably Parthian.

<sup>12</sup> I. Ashjeri .. .. .	51°	M. A.'s camp .. .. .	164°
New Kala'at .. .. .	98	<sup>13</sup> Old Kala'at .. .. .	320
Old Kala'at .. .. .	165	New Kala'at .. .. .	347
Landmark .. .. .	199	Extremities of inundation	4°—91
<sup>14</sup> New Kala'at .. .. .	89	F. road .. .. .	143
I. Ashjeri .. .. .	51	Zibliyah .. .. .	78
Landmark .. .. .	144		



ness. We therefore declined his coffee when presented; and abruptly retired. This brought our host to his senses, for he immediately followed and made a lame but humble apology for his un-Arab-like conduct. We were afterwards tended with the greatest solicitude—provender for our animals, food and firing for ourselves and servants, were brought without delay, and we had no further cause, for the night at least, to complain of incivility or inattention.

*Jan. 1, 1850.*—The new year commenced with a bitter disappointment to my companion and myself. We had fully calculated on spending the first day of the year upon the ruins of Nufur or Niffar, the ancient Babylon of Sir H. Rawlinson,\* and we had made a long journey the day previously for this purpose.

Our worthy host represented the way to the ruins as beset with innumerable difficulties and dangers; but, finding us to be stern in our resolve to overcome them, he yielded a reluctant consent that his son and a few horsemen should accompany us. After riding for upwards of an hour in a dense fog we discovered that we had been led a complete circuit round the camp! An angry parley ensued, as it was evident that our guides had received instructions to prevent our reaching the ruins. We therefore determined on giving up the attempt for the present, and insisted on being conducted to Shkhiyer. Slipping and sliding about in the mud and water of an extensive marsh, we reached that place in another hour.

Our journey had hitherto been through the district of the Zobeid Arabs under the late Sheikship of the Wadi Beg, an Arab appointed by Nedjib, ex-Pasha of Baghdad. In consequence, however, of his oppressive conduct and extortionate demands, the tribes over whom he ruled (for they included others as well as the Zobeid) were constantly in rebellion. Abdi, the new Pasha, therefore deposed him, and, at the time we passed through the country, he was in prison at Musseib. It was generally understood that the Pasha intended taking the management of these tribes into his own hands—a plan which appeared to give perfect satisfaction to the ill-used Arabs. Great jealousy and mistrust, however, during the interregnum were observable among the various neighbouring tribes, and, before reaching Shkhiyer, our guides took their departure, leaving us to enter the village without introduction.

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\* This is the conclusion arrived at by Sir H. Rawlinson, who places some confidence in the traditions of the early Arabs. The inscriptions upon its bricks prove that it was a great city long before Nebuchadnezzar founded the later Babylon, whose ruins still astonish the traveller, and concerning which its proud builder boasted, "Is not this great Babylon, that I have built for the house of the kingdom by the might of my power, and for the honour of my majesty?" Dan. iv. 30. Sir H. Rawlinson, moreover, states that Niffar was the primitive Calneh.

Shkhiyer<sup>16</sup> is a place of considerable size, situated on a narrow peninsula of low land, almost surrounded by the marsh. The huts are wholly constructed of reeds, which are tied in large bundles and neatly bent archwise. They are covered externally with thick reed matting, through which rain has some difficulty in penetrating.\* The muthif, or reception hut of the Sheikh, is about 40 ft. long and 18 ft. high, blackened in the interior with the smoke and soot of years, which have no other vent but the one entrance at the extremity facing the marsh. Numerous huge reed-baskets, containing grain, indicated the comparative wealth of their owners. The manly and expressive countenances of the inhabitants, and their remarkable partiality for bright-coloured clothing, proclaimed them to be of a different caste to the Zobeid. They subsist chiefly on the rice produced by the marsh-land, which, at the season of our visit and for a third of the year, is entirely covered by inundation.

The Shkhiyer is a division of the Affej tribe (Sheikh Aggab), whose residence is among the marshes which extend from the Euphrates, near Diwanieh, eastward into the very heart of the Jezireh, and southward to the Shat-el-Kahr. The whole Affej tribe numbered about 3000 families, whose annual tribute to the Pasha's treasury amounted to 100,000 piastres, or upwards of 900*l*. The Pasha had, we understood, announced his intention of doubling that amount for the ensuing year. The tribe was consequently in no slight state of fermentation, and complained bitterly of the treatment they had at various times experienced from the governors of Baghdad. Nedjib Pasha had thrice cannonaded the fragile town.

Communication is maintained with other places by means of long sharp-pointed boats, or canoes, called "*terrádás*," which are constructed of Indian teak, measuring from 12 to 14 ft. in length, by about a yard in width at the broadest part. They are propelled at a rapid pace through the shallow water by means of long poles.

We spent the afternoon upon the marsh and in making preparations to reach Niffar on the following morning. Nothing could exceed the hospitality and kindness of old Sheikh Shkhiyer, his sons, and the whole tribe; but there was an evident disinclination towards accompanying us to the ruins. Before quitting Baghdad we were told that the Arabs would throw innumerable difficulties in our way, and, if possible, thwart our object. They were certainly very suspicious of our intentions, and could not be persuaded to

\* An admirable description is given of the neighbouring but more important reed town of Suk-el-Affej by Mr. Layard, *loc. cit.*, p. 553.



believe that we merely wished to see a number of shapeless and barren mounds. They imagined that we must be in search of the treasure which Arab report says is deposited there.

Jan. 2.—After much persuasion we set out, accompanied by the Sheikh's youngest son Mahomed, and several horsemen of the tribe. Our whole party amounted to 17, well armed and mounted. The atmosphere was foggy, and in consequence of the distance we were obliged to ride much faster than we usually travelled, so that the position of Niffar in the map is not as correctly indicated as could be desired.\* It is, however, sufficiently correct for general purposes. The distance of Niffar in a direct line, bearing  $10^{\circ}$  s. of E. from Shkhiyer, is, as far as we were able to judge, about 11 m.; but, on account of the marsh, we were obliged to make a circuit of 15 or 18 m. to the N. In about three months' time, owing to the rise of the Euphrates and therefore of the marshes, the ruins would have become inaccessible from any side by land.

About 5 m. from Shkhiyer there is a small mound, with a ruined brick building;<sup>17</sup> and about 3 m. farther are numerous low but extensive mounds.<sup>18</sup> From both of these points Niffar and Zibliyah were visible on our return in the evening.

For a considerable distance before reaching the ruins we followed the course of a very large ancient canal-bed † flowing direct from Zibliyah. I am inclined to believe that this was one of the main branches, if not the principal bed, of the old Shat-el-Nil before mentioned as passing near El Hymar. All trace of its course is lost before arriving at the ruins, and I am uncertain whether it passed through them or disappeared in the marshes on the west. The Arabs at Ba'ashiyeh told us that the Shat-el-Nil flowed past Niffar, but none of our present party appeared to know anything about the matter.

The ruins of Niffar appear in the distance to be of considerable size, but it is only on approaching them closely that their actual magnitude can be conceived. We had but a short time to examine them: they consist of an elevated platform divided into two nearly equal portions by a deep channel 36 or 40 paces wide, running in a direction  $33^{\circ}$  E. of S. The extent of this platform is about 1 m. from E.N.E. to W.S.W. and about  $\frac{1}{2}$  of a mile from N.N.W. to S.S.E. Near the centre of the E. portion of the platform a conical

\* Sir H. Rawlinson, from astronomical observations taken on two occasions, in 1846 and 1848, places Niffar in lat.  $32^{\circ} 7' 3''$  S., and in long.  $45^{\circ} 15'$  E. See *Journal of the Royal Asiatic Society*, vol. xii. p. 481.

† Mr. Hector, of Baghdad, who visited Niffar in company with Sir H. Rawlinson, in 1846, called this canal, from Arab authority, "Derb-el-Jebābera," the Giant's Road.

<sup>17</sup> Niffar .. .. .	117°	<sup>18</sup> Niffar .. .. .	132°
Zibliyah .. .. .	23		

mound rises to the height of about 70 ft. above the plain, the average height of the platform itself being 30 or 40 ft. on the E. side, and 50 ft. on the W. The whole surface is covered with fragments of pottery, bricks with cuneiform inscriptions, and glass. The sides of the cone are difficult to ascend, owing to the quantity of broken bricks and rubbish which appeared either to have composed its exterior or to have fallen from some structure on its summit. The bricks are both sun-dried and kiln-baked: the building constructed of the latter is pierced with similar oblong apertures to those observed at the Birs Nimrud, El Hymar, and other ruins of the Babylonian age. These bricks were laid in bitumen cement, and bore inscriptions, although I was unable to procure one perfect. The remains of a large structure built of small bricks are situated on the W. platform. At a few hundred yards on the E. side of the ruins, fragments of what we supposed to be the exterior walls of the ancient city could be traced in a series of low continuous mounds.\*

I may here mention, for the instruction of future travellers, that the best period of the year for visiting Niffar is from the middle of October till the middle of December, when the inundation is low and the season healthy. We were rather too late, as the ground for 3 m. before we arrived at the ruins was so soft that our horses sank above their fetlocks, and the water of the marsh extended to within a mile of the ruins. The access to Niffar is more easy from the Tigris than the Euphrates, there being less water towards the E.

We succeeded in getting back to our tents at Shkhiyer before dark.

*Jan. 3.*—Being obliged to cross the marsh, our horses and mules were led a considerable distance in order to avoid as much of it as possible, but they had nevertheless to ford in 3 ft. water for nearly an hour, and in several places to swim the deep streams.

We were conveyed in terrádás to the end of the canal stream which flows from the Euphrates past the village and date-trees of Deggá'rah. After passing the mud fort of Abú Menhail, where its width is about 30 yards, it is lost in the wide portion of the marsh, over which we skimmed. We then followed a ditch or lane, scarcely broader than our canoe, keeping a southerly direction for about 1 m. among overshadowing reeds and long grasses. Getting at length clear of this confined navigation, we crossed another reach to a low mound of sundried bricks, called Lethamí, whence are obtained bearings of Diwanieh and other places on the Euphrates.

\* For a more detailed account of Niffar, and of the excavations undertaken there in 1851, consult Layard's '*Nineveh and Babylon*,' at pages 550 and 556.



Opposite to Lethamf we parted from our amphibious friends and resumed our journey on horseback across marshy and cultivated ground. We passed Imám Abul-fathl about 1 m. on our right, and soon reached a kala'at. Crossing a small stream we turned slightly to the right over more ploughed lands to an Arab encampment on the Bou-na'ash canal, 20 yards broad. It being too deep for us to cross at this point, the sheikh (who turned out to welcome us in a pea-green zibbún, yellow slippers, and red beard!) sent his son to show us a ford 1 m. higher up, where the water was but 4 ft. deep. This canal also flows into the marshes.

We now traversed a thick grove of fine tamarisks and some cultivation until we arrived at the square Arab fort and reed village of Húluce on the Bou-na'ash. A series of deep ditches or watercourses, as if for defence, completely surrounds this place.

A barren desert,  $3\frac{1}{2}$  m. across, extends from hence to Yúsufieh,<sup>19</sup> a small village surrounded by date-trees, and situated on an important canal or river of the same name. This is a main trunk stream from the Euphrates, and gives off several considerable branches during its inland course. It is here 45 ft. wide, but very deep, with high banks, and is crossed by a ferry-boat. The Arab town of Diwanieh stands 1 m. farther on upon the left bank of the Euphrates. Here we encamped for the night.

*Jan. 4.*—We duly delivered our letters to Abdi Pasha, who, with a camp of 3000 men, was stationed on the w. side of the Euphrates. He had been for some time previously engaged in the important work of rebuilding a "sud," or dam, at the largest mouth of the Hindieh canal near Musseib, above Hillah.

Soon after passing Musseib (lat.  $32^{\circ} 48' 15''$  N. and long.  $44^{\circ} 18'$  E.) the Euphrates is divided into two streams. The more easterly one, flowing by Hillah, retains its name, but the other is called "the Hindieh."\* It flows due s. until it spreads out into those extensive marshes w. of the Birs Nimrúd, which are believed to have constituted part of the Paludes Babylonie. After passing Kufa, the early seat of Mahommedan learning, it falls into the great inland sea, the Bahr-i-Nedjef. From hence two streams issue at Shinafieh, but they afterwards unite and form what is called the Semava or western branch of the Euphrates. When greatly flooded, the Euphrates frequently forces open a new passage, or enlarges that previously existing, at the entrance

\* It is supposed to be so called because its channel was improved by an Indian prince named Núwáb Shujah-ed-doulet. Is it not rather the Pallacopas of Alexander, dug after his Indian campaigns?

Down Canal .. .. .	141°	Huluce .. .. .	40°
I. Abu El-fathl .. .. .	337	Diwanieh trees .. .. .	170

of the Hindieh. Thus a considerable portion of its stream is diverted from the river, and it is necessary to restrain this efflux by building suds or dams at the point of bifurcation. The natural effect of too large a body of water quitting the Euphrates to flow through the Hindieh is to deprive the banks of the river and the country on the E. of their due share of irrigation at the proper season of the year, and to reduce all the canals on that side to such an extent as to cause the inhabitants of the villages on their course to abandon their lands. It is, therefore, to the interest of the Pashas of Baghdad to keep the "suds" or dikes in repair, but, unfortunately, the Khezaïl Arabs along the course of the Hindieh are a turbulent race and constantly in rebellion against the government. Their first object is to destroy the suds (which have cost so much money and labour) and to flood their marshes, because by so doing they are totally beyond the power of the pasha for the time being. The rebuilding and repairing of the suds is a labour of Tantalus for the perplexed Pashas of Baghdad. Abdi Pasha had recently completed a labour of this kind, and it was in consequence of it that so much of the country we had just traversed was inundated. He was now at Diwanieh watching the result of his work, and arranging matters consequent on the Wadi Beg's deposition. He used every effort to induce us to rejoin the troops on the w. of the Euphrates—representing the Mádán Arabs as perfectly beyond his control, wild and savage, and the country impassable on account of the waters. We released him from all responsibility concerning us, and he ultimately consented to send eight Bashi Bazúks with us in place of those who returned to Hillah. In the course of the day we also secured the services of an Arab sheikh who was acquainted with the line of route we desired to follow. We also provided ourselves with sheepskins to form a raft in case of need.

*Jan. 5.*—From Diwanieh the remainder of our journey through the Jezíreh was in a region hitherto untrodden by Europeans.

The general direction of the day's route was E.S.E., over a slightly undulating plain totally devoid of interest. At 7 m. from Diwanieh we left two small mounds, called Berhayn, on our right. Passing the old Kala'at Shermánieh<sup>20</sup> at 12 miles, in view of the distant trees of Mellahé, on the Yúsufieh on our left, we arrived at our night's encampment with a tribe of Khezaïl Arabs, near a number of ruined kala'ats. A large flat-topped mound, resembling a gigantic black tent, was conspicuous from all sides at 1½ m. from our camp. It was built of sun-dried bricks, and is probably not of greater antiquity than the time of the Parthians. At its

<sup>20</sup> Tabiah .. .. 164° 30' | Mellahé trees .. .. 66°



base were several ruined Arab enclosures, indicating that the locality was more populous a few years ago.

*Jan. 6.*—For 3 miles our road was due E., over ploughed land and through a thick grove of tamarisks, until we reached the Turunjieh Canal,<sup>21</sup> at the point where it leaves a larger stream called the Faw'war. Both canals flow into the marshes E. of the Euphrates. A strong dam at the entrance of the Turunjieh (which is here 80 ft. wide) had, until lately, admitted but a small stream of water, sufficient for the supply of one or two kala'ats and the cultivated lands adjoining them. The Arabs holding them, however, had become refractory, and refused to pay their taxes. They thought to defy the authority of the Pasha by destroying the dam over the Turunjieh, and inundating the country.

Mústapha Beg, the Kiaya of Baghdad, was despatched by Abdi Pasha with a strong force against the rebels, and his first care was to shut off the water completely from the Turunjieh, by building an enormous dam of earth and brushwood in the usual manner. He then proceeded to besiege a kala'at, to which the Arabs had retired, and sought to defend. We heard that he had taken possession of it that morning, the besieged having evacuated it during the night with all their moveables, leaving behind only mud walls and abundance of filth. No one was killed, no one wounded during the whole affair.

By means of the Kiaya's new dam we were enabled to pass dryshod over the Turunjieh. We then proceeded about 1½ mile S.E. along the course of the Faw'war, until we arrived opposite to the ruined village of Sûk-el-Faw'war.<sup>22</sup> Here the sheepskins obtained before quitting Diwanieh were of service. Being inflated and tied to our tent-poles and boughs of tamarisks, they formed a primitive sort of kellek or raft, by assistance of which ourselves and baggage were conveyed safely across the Faw'war, which was not less than 100 ft. wide and about 6 ft. deep.

The Faw'war canal is derived from the above-mentioned Yúsuffieh at Mellahé, and flows nearly due S. From the same point also the Yúsuffieh gives off the Shat-el-Kahr and other branches which supply the country farther eastward.

Nowhere is the effect of the Hindíeh, in abstracting too much water from the Euphrates, better understood than at Sûk-el-Faw'war. It was formerly a large and thriving town, like Affej or Sûk-es-Sheionkh, the centre of a district belonging to the Montefik Arabs, and surrounded by a series of small towers and

<sup>21</sup> B. road to Kalah . . . . . 270°

<sup>22</sup> Tabiah . . . . . 266

Mellahé trees . . . . . 352°

Kalah on left . . . . . 189

watercourses for defence against their more unsettled neighbours. About twenty-five years ago, according to the best information we could obtain, the town was abandoned in consequence of the water having deserted the canal, owing to the breaking of one of the dams at the mouth of the Hindieh. The country *e.* of the Euphrates became a waterless desert beyond the borders of the great marshes. At the time of our visit, decayed date-trees and the ruins of the mud houses of Sūk-el-Faw'war extended full half a mile along both sides of the stream, and afforded good shelter for jackals and serpents. Abdi Pasha's late work at the Hindieh had, however, restored a copious stream to the channel of the Faw'war.

A winding course of 2 m. brought us to the Muthlim canal, another branch from the Yūsuffieh at Mellahé. Although of but inconsiderable width, it was 5 ft. deep, and overflowed the country on both sides. We encamped on the eastern bank, near Kala'at Muthlim,<sup>22</sup> with the Amír tribe of the Khezail. Three small mounds, called Bahrí, with fragments of ancient pottery, were situated about  $\frac{1}{4}$  of a mile *N.N.E.* of the kala'at.

*Jan. 7.*—Leaving the inundated lands adjoining the Muthlim, we crossed a desert tract slightly rising in the direction of our route. At 8 m. from the kala'at is a small square Arab mound, called Ed-desim,<sup>23</sup> whence we defined the course of the Shat-el-Kahr on our *E.* by fixing the positions of Kala'ats Detcheh, Haibah, Djemideh, &c., on its banks 2 or 3 m. distant. Passing a mound of no great size on our left called Djemideh, and at 4 miles on our right an Imám named Sahib Ez-zemán, we reached another ruined kala'at—Mulkhezí,<sup>24</sup> 1 m. from Ed-desim.

The ground here becomes lower, and continues descending to the dry bed of a river or canal, called Skhain, or Es-skhain,<sup>25</sup> but which our Sheikh knew also as the old bed of the Faw'war. He said that it likewise became dry twenty-five years ago. The channel is 270 ft. wide and 15 ft. deep, almost large enough to absorb the stream of the Euphrates; whether it has ever done so, or whether it was merely the course of the Faw'war widened through want of proper attention to the banks, I am unable to say. It may possibly be the continuation of that branch of the Níl which I believe to have passed Niffar; at any rate, on looking at the map

<sup>22</sup> Mellahé trees .. .. .	312° 30'
Suk-el-Faw'war .. .. .	247 30
Kalah on left .. .. .	229
F. road .. .. .	116
Bahri .. .. .	17
<sup>23</sup> K. Mulkhezí .. .. .	149
K. Djemideh .. .. .	59 15
K. Haibah .. .. .	25

K. Detcheh .. .. .	22° 30'
I. Sahib Ez-zemán .. ..	202 30
<sup>24</sup> I. Sahib Ez-zemán .. ..	216
K. Djemideh .. .. .	30
K. Haibah .. .. .	10 30
K. Detcheh .. .. .	8
Phara .. .. .	90
<sup>25</sup> K. Mulkhezí .. .. .	303



it will be seen that the directions of the two channels correspond in a singular manner. The Skhain pursues an E.S.E. course, giving off branches on either side. We followed it for nearly 4 m.,<sup>21</sup> when our road struck off more easterly. In the centre of the channel are several deep holes, dug by the Arabs for water, which it evidently contains at some period of the year, as proved by the abundant remains of shells, with their coloured epidermis, belonging to several freshwater genera.

A patch of sandhills crosses the road at 6 miles from Kala'at Mulkhezi, having precisely the same features as near Ba'ashlyeh. The Gúerma Canal,<sup>22</sup> containing a little water, occurs about 1½ m. farther. Imám Seyd Sáfi stands on it, 2 m. to the s. We were told that it proceeds from a place called Terrah, a considerable distance on our left, out of the Shat-el-Kahr. At 1½ mile beyond this we encamped in the desert at the Khurukha<sup>23</sup> canal from the same source, where we procured excellent water.

*January 8.*—Our route continued towards the E.S.E. over a perfectly level plain, with the hitherto unvisited ruin of Hammam towering in the horizon with the morning mirage. After travelling for several successive days over an uninteresting desert, the first sight of one of these vast piles erected in a remote age is impressive in the extreme. The hazy atmosphere of early morning is peculiarly favourable to this feeling, and, as a veil of gray mist hangs between the object and the beholder, he is lost in pleasing doubt as to the actual reality of the vision.

Advancing to the point in view, we passed on the right three extensive ranges of mounds—Wafri, El Azrah, and Wáshi; all, I believe, of ancient date. As we approached the ruin, the lofty mound of Tel Ede or Yede rose in the S.E. horizon.

We had been told by the Arabs that a statue existed at Hammam, but as little reliance is to be placed on their information on such points, we paid very slight attention to their account. Great, therefore, was our delight and astonishment, when, at about 200 yards from the N.W. corner of the ruin, we were shown three broken fragments of a human figure in fine-grained black granite, the proportions and carving of which would not have disgraced a Grecian chisel. The bust—minus head, neck, and arms—is broken from the rest of the trunk at the waist. The hands are clasped in front, and appear to hold up the hem of a garment thrown loosely over the left shoulder. The right shoulder is bare and inscribed with a (now defaced) cuneiform legend. It measures 1 ft. 4 in.

<sup>21</sup> I. Sahib Ex-zemán .. ..	255° 30'
K. Mulkhezi .. ..	278
Phara .. ..	358
I. Seyd Sáfi .. ..	128
F. road .. ..	104

<sup>22</sup> I. Seyd Sáfi .. ..	197° 30'
El Wafri .. ..	126
<sup>23</sup> I. Seyd Sáfi .. ..	222
El Wafri .. ..	187 30

from neck to waist, and when perfect 1 ft. 7 in. from shoulder to shoulder. The second portion, broken from the first, represents the remainder of the trunk, and measures 2 ft. 6 in. in length. The surface is much injured, but upon the right hip and side is another defaced inscription in complicated Babylonian characters, bordered with a deep fringe similar to that seen on Assyrian sculptures. The third and last portion of this interesting relic is a shapeless block 1 ft. 1 in. long, by 10 in. wide, polished on one side, and exhibiting a piece of garment fringe. In it also is a curiously cut hole, the use of which is unintelligible. We were informed that, less than two years previously, this statue was quite perfect, but that a tribe of persons, who work in iron \* near Sūk-es-Sheioukh, had broken it with large hammers in the expectation of discovering gold inside! It had since served the Arabs as a target for ball practice! As, however, statues of the Babylonian age are rare, I secured the three fragments—scratched and damaged as they are from the ill-usage they had sustained—and carried the awkward loads on the backs of our mules to Basrah, whence they were shipped for England.†

The building of Hammam ‡—"the high place," no doubt, from which the condemned idol had fallen—rises 50 ft. above the surrounding plain, 28 ft. being brickwork, the rest mound. Seen from the n.w. the summit appears to project over the sides, owing to their having fallen away at the base. The original form was a square, the sides of which are now reduced to 78 ft. each, and the angles rounded off. The most n. angle points 20° E. of N. A deep channel, caused by rain, furrows the centre of each face, leaving the angles projecting upwards like four rounded turrets, which are likewise considerably weatherworn. The bricks are sundried clay, mixed with barley chaff and chopped straw. They measure 14½ inches square by 5 or 5½ inches thick. Between each layer is a layer of reeds, whose projecting ends form penthouses which have preserved the building from complete destruction by the elements. At the base lie quantities of broken kiln-baked bricks, of which undoubtedly the exterior surface was constructed.

\* The Sabæans, or Christians of St. John Mendai, are here implied. A few families of this interesting and ancient race still remain at Sūk-es-Sheioukh, Basrah, and Dişful, where they maintain themselves as blacksmiths and jewellers.

† They now lie in the cellars of the British Museum. They form, I believe, the only specimens of undoubted Babylonian statuary yet brought to England. A second but smaller statue, obtained by me in 1854 from the neighbouring mound of Yok-hah, has since arrived and is deposited at the same place.

‡ Sir H. Rawlinson states that Hammam is probably the Gubaba of cuneiform inscriptions.—*Proceedings of Royal Geog. Soc.*, vol. i. p. 47.

20 Tel Ede .. .. .	192° 30'
Eth-thahir .. .. .	74 30
Kala'at Rothan .. .. .	96
.. El-mashe .. .. .	164

Mureichin mound .. .. .	206° 30'
Ed-douwa .. .. .	236
Trees of Turra on the Kahr	351 30



Numerous low mounds surround the edifice, and extend to a great distance on the w.s.w. They would, I apprehend, well repay excavations. Pieces of black-grained granite, scoria, bricks, glass, pottery, &c., are strewn on the surface; and at the s. corner of the tower is a slab of vitrified scoria 21 by 23 in. square, and 4½ in. thick, of a dark gray colour. I picked up the alveolus of a belemnite characteristic of geological formations, which do not occur nearer than the Persian mountains. A few hundred yards s. of the tower are four small conical hillocks in a square. A ruined edifice stands a little eastward of this point. I regret not having had more time to bestow at this interesting locality.\*

From Hammam our course lay s.s.w. towards Tel Ede, 6 m. distant. On the surface of the desert I here discovered the first indications of a post-tertiary marine deposit in the presence of two broken shells of the genus *Strombus*. Just before arriving at the mound we turned aside to the e. for the purpose of examining a large range of sandhills, which extend in irregular, undulating hillocks towards the n.e., and also towards Tel Ede. Decayed stumps and branches of tamarisks jut out from the hillocks as though they were destroyed or choked by the drifting sand.

We had now attained the Montefik country, and, as we advanced, a half-naked race of savages—wearing no covering but a loose abba, their long locks streaming wildly in the wind—rushed out, spear and club in hand, to meet our little party, who, they supposed, were going to plunder them. Children were busily engaged in driving the cattle from every direction towards the tents, where the women kept up their peculiar and shrill tahlehl. Sixty warriors advanced in two lines in New Zealand fashion, with a kind of running dance, singing their war-cry, and throwing up their weapons high into the air to catch them again with great dexterity as they descended. Proving, however, to be peaceful travellers we were allowed to pass unmolested, and were subsequently entertained at their camp. These Arabs belonged to the Madán tribes; they possess large flocks of cattle and sheep, which find excellent grazing on the short green herbage springing up after the early rains among the sand-dunes.

Tel Ede or Yede<sup>21</sup> much disappoints the expectation. It is a huge artificial pile of solid sand, 90 ft. high. The circumference of its base is 850 paces. The form is irregular, the longest diameter measuring from n.w. to s.e., and the highest point is the n.w.

\* An edifice resembling that of Hammam, but on a smaller scale, stands 3 m. e. of Bir-oufis, on the road between Baghdad and Hillah. It is called Sheikh Shábar, or Towebah.

<sup>21</sup> Nuffayji mound .. .. . 207° 45'	Mound .. .. . 130° 30'
Warka great mound .. .. . 204	1. Seyd Sáfi .. .. . 317 45

The s.w. face is inaccessible, while that on the n.e. is furrowed with deep channels. A portion of the n.w. side is much weathered, and the solid sandy mass exposed and deeply eroded. Neither bricks nor pottery were observed on its sides or at its base, as at nearly every other ancient mound, although there are low mounds covered with these usual relics on the n.e. The sandhills stretch out visibly to a great distance on the s. and s.e. To the s.w. the eye dwells on the immense mounds of Warka, 10 m. distant. We encamped for the night with our newly-made savage friends, 2 m. s.s.e. of Tel Ede.

Jan. 9.—The sandhills extend from n. to s. in a kind of belt. At 2½ m. we descended from them into a level plain, from which rose on both sides a few small artificial mounds. At one place the ground was covered for nearly a mile with a carpet of the richest verdure I ever beheld, and numerous herds of beautiful gazelles, browsing upon it, bounded off at our approach. This scene was the more delightful when compared with the barren and glaring desert of the other portion of our journey. The lofty and imposing mounds of Warka<sup>29</sup> added to the effect of this scene, as they rose more fully into view and afforded full scope to the imagination. After crossing the outer walls of the city, each step that we advanced convinced us that it was one of the most important ruins in Mesopotamia, and that its vast area abounds in objects of the highest interest and value to the historian and antiquary.

A detailed account of Warka would occupy too much space in this paper; it is therefore my intention to devote a separate memoir to do the subject full justice at another opportunity.

It may not, however, be out of place to remark, that this portion of Chaldæa is occupied by the remains of numerous ancient necropolis-cities. Of these, Warka is infinitely the most extensive and remarkable. Its walls, 5½ miles in circumference, enclose an enormous platform of mounds and ruins, while the desert beyond is studded with large conical mounds, one of which, Nuffayji, stands a mile distant from the walls, and rises to the height of 90 feet.

There are three principal structures upon the platform—temples or tombs—it is impossible to ascertain which, without excavations carried on at great expense. Of these the “Bouárieh”—so called from the “reed mats” placed at intervals between its mud bricks—is supported by buttresses of brick-masonry bearing legends of Uruk, a monarch whom Sir H. Rawlinson believes to have flourished B.C. 2300.

<sup>29</sup> From the great mound at Warka—  
Tel Ede .. .. . 24° 30'  
Nuffayji .. .. . 1 30  
Trees .. .. . 306 15

Kala'at .. .. . 301° 15'  
I. Khitir .. .. . 212 30  
Sinkara .. .. . 102 30



The second edifice affords a very important addition to our knowledge of Babylonian architecture at a later age.

The great feature of the ruins is the mass of sepulchral remains which constitute the chief portion of the great platform, and prove beyond a doubt that Warka was a sacred burial-place from the very earliest times till about the commencement of the Christian era. Among other forms, slipper-shaped coffins of glazed earthenware extend to the depth of 30 (and perhaps 60) feet.

The most valuable discovery was that of some tablets, which, according to Sir H. Rawlinson, bear the names of Seleucus and Antiochus the Great, proving that cuneiform writing was practised as late as 200 B.C.

Although the phonetic name of Warka has not been determinedly fixed from the cuneiform inscriptions, there can be little doubt of its identity with the Erech of Scripture—Nimrod's second city. Sir H. Rawlinson finds it generally designated as, *par excellence*, "the City;" and he therefore assigns to it a very remote antiquity.

We spent  $2\frac{1}{2}$  days in rambling over and examining the ruins, during which time we made as correct a plan as circumstances would permit. It was with no little regret that we were once more obliged to proceed on our journey, but we hoped that an opportunity would again occur of revisiting a spot so replete with interest.\* Many small objects of value were obtained during this visit.

Jan. 11.—From Warka to the new Kala'at Debbi, or Dúráj, on the Euphrates, is a distance of 9 m. S.S.E. The latter part of the road passes over rough ground among decayed reeds, and is intersected by numerous canal beds, at this period of the year perfectly dry. We encamped for the night in sight of Tel Ede, Warka, and Sinkara, which is another large ruin bearing 10 m. E. by S. from Warka.

The Madán Arabs, on the Euphrates between Semáva and Súkes-Sheioukh, were at this time governed (?) by a chief appointed by the Sheikh of the Montefik. Two brothers, Sa'adún and Debbi, had for many years enjoyed this lucrative post alternately. The

\* On reaching Mohammerah, and announcing the results of our discoveries to Col. Williams, I was directed to return to Warka, and to make excavations on a small scale. I was rewarded by securing the three remarkable slipper-shaped, glazed coffins, and other articles, now in the British Museum.

In 1854 I spent three months at Warka and its vicinity, in charge of the expedition sent out by the Assyrian Excavation Fund. A portion of the results obtained during the researches was published in the First Report of the Committee. I propose shortly to prepare a full account of my labours for the press.

22 "Wuswas" ruin at Warka  $33^{\circ} 30'$   
Tel Ede .. .. 2

Sinkara .. ..  $47^{\circ} 30'$

former was now Sheikh; the latter resided at the Kala'at, which he built and therefore named. When in authority, he is a cruel tyrant. We saw several poor wretches whom he had deprived of their hands or feet.

*Jan. 12.*—This day we followed the downward course of the Euphrates E.S.E.

From Dúrájī to the small Imám Khithr<sup>24</sup> is 5 miles, beyond which are visible on the left the vast marshes of Shatra, formed by the junction of the Shat-el-Kahr with the large branch of the Tigris, the Shat-el-Hie, which joins the Euphrates somewhat lower down.

We crossed the "great river" by means of a ferry-boat at a ruined Kala'at, 17 m. below Dúrájī. At this season of the year the w. side of the Euphrates is frequented by numerous wild Bedouin tribes for the sake of the vegetation on its banks. We passed several small encampments of Aneza and Dbefyr without being in the least molested.

After travelling 5 miles farther over cultivated lands, with the distant ruin of Mugayer in sight on our right, we encamped at the tents<sup>25</sup> of a tribe of Agail Arabs, opposite to Imám Sheriff. From this point commence the date groves, which extend in uninterrupted line along the river's course to its entrance into the Persian Gulf. We here found a messenger from the Sheikh of the Montefik awaiting the troops, which, notwithstanding our zigzag route and delay at Warka, had not yet arrived. This gave us an opportunity of visiting the Mugayer, and we, therefore, made our arrangements for the morrow.

*Jan. 13.*—The celebrated canal, Pallacopas, cut by Alexander the Great, is laid down on several maps between the Euphrates and Mugayer. I looked around carefully in the hope of detecting some trace of it, but without success. There is certainly a small stagnant piece of water in a modern and insignificant canal-bed, about 1½ m. from the Euphrates, but this is not of sufficient importance to warrant its being considered any part of the ancient stream. The channel may, however, have become filled up with sand, and we had no opportunity of searching farther in the desert westward.

The Mugayer,<sup>26</sup> sometimes incorrectly called Umgeyer, was first described by Mr. Baillie Fraser,\* whose description is generally correct. It is, however, only 6 (not 10 or 11) miles from the nearest point of the Euphrates, and is situated at the N.W. corner of extensive but low mounds, and consists of two distinct stories. Like the

\* 'Mesopotamia and Assyria,' p. 148.

<sup>24</sup> Sinkara . . . . . 18° 30' | I. Sheriff . . . . . 356°

<sup>25</sup> Mugayer . . . . . 178. 45 | <sup>26</sup> Abú Shehrine, or Shahrein, 214 15'



two kiln-brick buildings at Warka, two of its angles face the cardinal points (the *N.* and *S.*). The *N.W.* and *S.W.* sides of the lower story are tolerably perfect; the former measures 133 ft., the latter 199 ft. in length. Shallow buttresses, 8 ft. wide, occur at every 15 or 16 ft. apart. The elevation was measured on the *S.W.* side, and shows the total height of the ruin to be 53 ft. 9 in. It stands on a mound covered with rubbish, which makes the height of the Mugayer above the desert about 70 ft. As the brickwork rises in height it gradually slopes inwards at an angle of  $9^{\circ}$ , and to this circumstance may be attributed the comparatively perfect condition of the structure. Between the stories is an inclined plane, which measures 19 ft. on the *S.W.* and 30 ft. 6 in. on the *N.W.* side, from the top of the lower story to the base of the upper. This incline was, probably, a flight of steps, as I observed at the *W.* corner eight rows of bricks, the lower ones of which project 6 in. beyond those above. A similar arrangement is observable at the top of the upper story.

The *S.W.* wall of the upper story is 119 ft. long, but broken at several places and encumbered with rubbish. At the *W.* corner a small piece of sun-dried brickwork is visible. Of this probably the interior of the fabric is composed. The length of the *N.W.* side is about 115 ft.

At the centre of the *N.E.* side of the building there appear to be the remains of a flight of steps of brickwork, 8 ft. wide, ascending from the base to the summit of the edifice, but it is almost concealed by broken bricks and rubbish. I fancied that one, or probably two entrances could be distinguished at the *S.E.* side, but here the brickwork has nearly all fallen. A quantity of rubbish conceals a large portion of the lower story on the *S.W.* side.

We looked in vain for the circular hole observed by Mr. Fraser on the summit, but could only discover a slight depression, which did not in the least strike us as likely to have been, as that gentleman suggested, an entrance to the interior. I much doubt there being any chamber within the structure.

The apertures, which pierce the brickwork, are similar to those seen in all structures of the same age. I observed that the thick layers of bitumen with which the bricks are cemented, have in many parts pieces of broken bricks and pottery mixed with it.

From the summit we procured a few bricks bearing inscriptions, copies of which were carefully made, and also one with a smaller square-stamped legend.

A few paces from the *S.E.* base and near the *E.* corner is a small mound, the summit of which measures 36 ft. square. The sides are covered with slag and scoria. Possibly it may have been the foundation on which a fire-altar once stood.

About 200 yards from the *N.E.* base Mr. Churchill discovered

three large blocks of black granite projecting from the mound. On removing the earth some parts exhibited a fine polish, but they are so much broken that their original form could not be distinguished. They possibly belonged to a statue or altar which occupied the depression on the top of the building. Upon one of these blocks was an inscription. Another piece, about 1 ft. 10 in. long by 2 ft. wide, appeared to be the top of an altar or table, the upper surface of which was plain; a moulding rounded off at the angles, and 8 in. deep, ran along the top of each side. Upon two opposite sides were ornaments in high relief resembling a capital letter A reversed, and supporting the moulding. The third side was plain, and the fourth, opposite to it, broken. The base was not found.

Near the N. corner was another block, which exhibited symmetry, and which we concluded was the back of an enormous colossal figure. With all the strength of our party it could not be moved from its position.

The surface of the mounds around is strewn with the usual relics, but time did not admit of our examining them.

From the Mugayer several large mounds are visible in the s.w., one of which, called Abú Shahrein, is of some importance, having apparently the remains of a large building on its summit.\*

We rejoined our tents and baggage at Arjah<sup>27</sup> on the Euphrates, 6 m. S.E. of the Mugayer, where we also found the troops had arrived from Diwanieh. The remainder of the journey to Busrah was performed in company with them.

*Jan. 14.*—Following the course of the Euphrates in a S.E. direction over broken ground and dead reeds, the party at length reached Swaje, 1 mile above the town of Súk-es-Sheionkh, where is the usual encampment of the powerful sheikh of the Montefik. I need not dwell on a description of this place, since it has frequently been visited by European travellers. The number of coloured natives much surprised us.

Fahád, the Sheikh recently appointed in place of his deceased brother Bunder, behaved with the most princely hospitality, supplying not only ourselves, but the whole of the troops, with corn and

\* During the early part of 1854, Mr. Taylor, Her Britannic Majesty's Vice-Consul at Busrah, acting under Sir H. Rawlinson's instructions, made extensive excavations at the Mugayer, the results of which have recently appeared in vol. xv. part ii. of the 'Journal of the Royal Asiatic Society.' It will be interesting to compare my account of the great edifice with his; but it must be borne in mind that the above was written four years before Mr. Taylor's discoveries. Allusion is here made to some points which that gentleman omits. From an examination of the Mugayer cylinders of Nabonidus discovered by Mr. Taylor, Sir H. Rawlinson says that its name was "Húr," the Ur of the Chaldees. May not, however, the locality mentioned in Genesis refer to a district, its name being still retained in the Greek *Oxyra*, the modern *Warka* †



provisions during our stay and for our future journey of 2½ days across the desert to Zobair. He exhibited his independence, however, by receiving the Turkish officers seated,\* and would not permit either them or the soldiers to enter the town of Sūk-es-Sheioukh under any pretext on horseback.

*Jan. 15.*—On quitting Swaje we passed several small mounds of ancient construction; viz. Ma Battúsh,<sup>32</sup> Shán-el-Abd, Musbah, and Tel-el-Lahm. The first 5 miles of our progress was much retarded by marsh and inundation, after which a perfectly dry desert succeeded.

At about 9 miles from Swaje may be said to commence the beds of sand, gravel, and gypsum, which extend without interruption to beyond Zobair. The gravel, which forms undulating ridges, is chiefly composed of pebbles of white and coloured quartz, much rounded by attrition and varying in size at different localities; sometimes they are extremely small, and at others more than 2 in. in diameter. Its other components are red and black cherts and clays, black flinty slate, porphyry, and a few pebbles of pinkish granite, composed of quartz and feldspar (and oxide of iron). Judging from their angular aspect in many instances the pebbles have not been transported from a great distance. Many other altered and igneous rocks occur here which are not found in similar beds at Mizrakí Khán, between Baghdad and Hillah. I am therefore inclined to think that the southern deposit of gravel is derived from a different source—say from the Persian mountains—while the northern beds have been brought from the Taurus. I do not, however, advance this hypothesis with any degree of certainty.†

We halted for the night without water.

*Jan. 16.*—By directing our course considerably to the E. of the usual road we were enabled to reach the great inundation of the Euphrates at 7 o'clock in the evening. Our poor animals had not drank for 32 hours. The shore of the inundation is white with small quartz-pebbles. Throughout the day not a single object of interest attracted the attention.

*Jan. 17.*—The same monotonous undulations of gravel and sand

\* On my return to Warka a month afterwards, I was under great obligations to Sheikh Fahád for the security he afforded me among the wild Mádn at Warka and Sinkara. It was therefore with no little regret I subsequently heard that Fahád had been poisoned by the Pasha's orders, at Zobair, for his behaviour to the Turkish troops, as above described!

† At the time the above was written I was unaware of the fact, since ascertained by Mr. Taylor, that black granite (basalt?) abounds farther to the W. See '*Asiatic Soc. Journ.*,' vol. xv. p. 404. To this igneous eruption may be attributed the altered rocks.

<sup>32</sup> Imám Abbas at Swaje	..	40° 45'
Tel-el-Lahm .. ..	..	198
Tel Mathara .. ..	..	271 16
Tel Ishán .. ..	..	199 5

Minaret at the Sūk	..	83° 30'
Tel Musbah .. ..	..	143 45
Tel Shan el-Abd ..	..	112

continued till evening, when we caught sight of Jebel Sinám (a solitary pile of basalt), far in the s.w., which served in some degree to relieve the tedium of our march till nightfall.

We encamped at Zobair,<sup>22</sup> a picturesque old Arab town, with quaint square towers and numerous minarets. The modern town is built on the ruins of old Busrah, which occupy an enormous space and extend to the extremity of the gravel deposits, that terminate in the marsh or inundation of the Shat-el-Arab. This vast sheet of water reaches up to the very walls of modern Busrah, 5 miles. In consequence of it, and the neglect of the Turkish authorities, this once thriving city is become a complete pest-house, and must in a few years cease altogether to exist, unless the Porte act promptly and cause the Euphrates to be restrained in its channel by means of strong dams. With the death or departure of the greater portion of the inhabitants, commerce has almost entirely ceased; one or two European vessels now alone forms the yearly average, in lieu of the numbers which a few years ago frequented the commodious anchorage in the noble Shat-el-Arab.

Having given our animals a day's rest at Busrah after their fatiguing march, we resumed our journey, and on the following day joined Col. Williams and the remainder of his party at Mohammerah, the most southerly point on the Turco-Persian frontier.

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It is necessary to remark that the map which accompanies this paper was constructed by Mr. Churchill from careful traverse bearings taken by us both with an excellent prismatic compass, made by Troughton and Simms. The traverses were then squared in between the fixed points Baghdad, Hillah, Diwanieh, Súk-es-Sheioukh and Busrah, as laid down by the officers of the Euphrates Expedition.

The routes between Hillah, Meshed Ali, and Kerbellá are also from actual bearings taken by Mr. Churchill and myself during a visit made to those places in the autumn of 1849.

The entrance of the Hindieh Canal, or branch of the Euphrates, is given from my own observation.

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N.B. Much reliance must not be placed on the bearings given in the margin. They are taken from rough notes, my original road-book having been recently lost in the Turkish post, which was plundered by the Arabs between Baghdad and Jezireh-bin-Omar. The bearings are corrected to 2° w. variation.

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<sup>22</sup> Sheikh Ma'arúf . . . . . 172° 30'  
Jebel Sinám . . . . . 193. 15



XII.—*On the Formation of Cyclones and the Tracks they pursue.*  
By, Captain ALFRED PARISH.

Communicated by Captain R. FITZROY, R.N., F.R.G.S.

Read, February 28, 1856.

WITH much diffidence I advance a theory which appears to me to supply some explanation of the formation of cyclones and of the tracks they pursue: the result of a long, practical, and close study of the winds and weather which I have met with in my own voyages, and from the investigation of a number of log-books to which I have had access.

All winds, except where influenced by the proximity of much land, appear to me to be parts of cyclones obeying in their respective hemispheres the laws which have now been proved to govern hurricanes, both with regard to their tracks and rotatory motions.

By the term cyclones, I mean rotatory winds advancing on a line. When of very large diameter, such as those of which trade winds may form a part, they strike the surface diagonally; but where of limited diameter, as in the higher latitudes, or of still less diameter, as in the hurricanes of the tropics, they descend horizontally, or so nearly that from their small size they may be looked upon practically as being so. They invariably increase in strength towards the centre, and the less their diameter the greater the force of wind seems to be.

About the tropics, easterly winds are to be found, veering towards the equator, more directly as they near it; but gradually veering more from the westward, and in many places becoming due westerly on the equator, or, more correctly speaking, *about* the equator, for the belt of westerly winds appears to move more northerly or southerly, as the sun is in north or south declination. These winds seldom exceed a fresh gale, when the sun has been long in the opposite hemisphere. But in that hemisphere in which the sun has long been, cyclones arise of limited diameter and of hurricane force, also having westerly winds on the equatorial, and easterly winds on tropical quadrants; blowing directly towards the equator on their westerly quadrant, and moving invariably towards the west. Their tracks slightly incline towards the south in southern, and north in northern hemispheres, and disappear about the tropics.

Immediately without the tropics, cyclones appear to me to form of greater diameter than those within, and to travel towards S.E., E.S.E., and finally due E. as they approach lat.  $28^{\circ}$  or  $30^{\circ}$ .

In higher latitudes, quoting from my own observations only, I look upon the winds as blowing in a constant succession of cy-

clones,\* of probably 1000 m., or thereabouts, in diameter, descending upon the surface horizontally and moving on parallel lines, travelling invariably towards the E., but never equalling in force the hurricanes of the tropics. I would point out the great regularity which prevails in high latitudes in the southern hemisphere, in the succession of these cyclones. First we find light air springing up from the northward, being, I conceive, the easterly part of a cyclone overtaking the ship: then a steady wind from the northward for several days, if the cyclone is moving at a moderate rate, water smooth and ship sailing well; then a north-west and west-north-west wind for some days increasing in strength; then a sudden shift of wind to S.W. squalls, moderating, wind hauling to the southward, and either falling calm as the cyclone leaves the ship, or blowing fresh from the S.E. for a day or two. The changes of wind and fall of barometer until just before the shift to south-west, when it begins to rise again, will point out the cyclone's rate of progression and exact track. The navigator is thus enabled to foretell with certainty how the wind will be, and of what force for some days, and may even choose the strength of wind most advantageous for him in many instances, by hauling more or less to the northward.

I have found these laws to apply equally to the gales of wind between the Azores and the British Channel, but their diameter appears to me to be much larger there, and consequently the changes cannot be taken so much advantage of.

I may here also mention that I have several times found a cyclone of about 700 m. in diameter, to the southward and on the meridian of Cape L'Agulhas, nearly stationary when on the S.W. quadrant of it, with the wind from S.E. A ship bound to the eastward, by standing to the south-south-west, will find the wind haul gradually to east and east-north-east, and thus sail round it and proceed with a northerly wind.

In endeavouring to trace the cause of these winds, let me first consider those within the tropics.

The heat of the surface not being so great in one hemisphere when the sun has been long in the opposite one, the air from the extra tropical regions would flow in evenly and continuously, and thus occupy the space between the tropics and the equator in one mass; we should look then for steady winds except where influenced by large continents or other local causes. When it first reached the surface within the tropics, the difference between its rotatory velocity and that of those regions would be great; it would move towards the E. more slowly than the earth's surface there, and consequently would make a current of wind from the eastward; but being at the same time urged on towards the more heated regions nearer to the equator, the wind would become south-east in southern, and north-east in northern latitudes. After



passing over a few degrees of latitude it would participate more nearly in the motion of those parts; the difference of velocity would diminish, and the impulse towards the equator become more direct, forming a southerly wind in southern and a northerly in northern hemispheres. As it neared the equator, it would acquire still more nearly the velocity of the surface, and become first a south-westerly or north-westerly and then a westerly wind, not from gaining upon the earth in its motion, but by lagging less behind than the rest of the mass, the whole of such mass moving apparently towards the westward. Having become heated, it would then rise and flow over towards the poles, thus forming a circle striking the surface diagonally. In some parts of the equatorial regions the southern cyclone seems to rise from the surface at that point which represents the s.w. or s.s.w. winds, and the northern one at that representing the n.w. or n.n.w. winds; while in other parts, especially towards large continents, the due westerly winds appear to extend over many degrees of longitude. May this not be from local influences or difference in the humidity of the atmosphere causing a variation in the angle at which the cyclone strikes the surface diagonally?

When the surface within the tropics is overheated by the sun's long presence over one hemisphere, the air expanding and rising more rapidly from that hemisphere, and consequently the colder air rushing in with greater force; is it unreasonable to suppose that, instead of forming one large cyclone, it should be broken up at times into smaller ones, which, from being transferred so much quicker than usual from one region to another, would reach the surface with far greater difference of velocity and impulse, and thus form cyclones of hurricane force and small diameter? Each cyclone, bringing its polar velocity with it, would then lag behind the earth, or more apparently to the westward, and being under the same influences as the larger circle of steady winds would veer the same way, namely, easterly winds on the segment towards the tropics, blowing towards the equator on its western side, and from the westward on its equatorial side. Would not each of these small masses, detached with great violence from the larger cyclone, naturally complete the eddy with incurving circles such as we find in tropical hurricanes?

With respect to the cyclones of the higher latitudes, two theories offer themselves to my mind.

1st. The heated equatorial air, while it rises and flows over towards the poles, carries with it the rotatory velocity due to its equatorial situation, into higher latitudes, where the earth's surface has less motion. Hence, when it first returned to the surface, in its circulation beyond the tropics, it would gain on the earth in the motion of rotation there, and therefore move bodily to the eastward, forming apparently a westerly wind. Advancing over a

few degrees of latitude, it would, by participating more nearly in the velocity of those regions, blow more directly towards the poles; and afterwards, though still gaining upon the surface, it would, by dragging as it were more upon the earth, and thus lagging behind the rest of the mass, cause an easterly wind on that quadrant of it nearest to the poles. Ultimately, the air would be drawn away towards the more heated equatorial regions, and thus complete the revolution of the cyclone.

2nd. In offering my second proposition, I select the southern hemisphere to save confusion of terms.

The air flowing over towards the poles with a greater rotatory velocity, would, when its influence in descending was first felt at the surface, be a light breeze from north-north-west, or thereabouts; as it continued to descend, it would increase in strength, gradually lose its impulse towards the pole, and therefore become a strong westerly wind; when it reached its lowest point, the gale would then be at the heaviest, it would then begin to flow in towards the equatorial regions, and thus form a south-westerly wind. The space would then be re-occupied, either by another descending current, or by winds from still higher latitudes flowing in towards more heated regions. In the first case, it would finish with light airs from the southward, to recommence at N. and N.W.; in the second case, after the south-west winds, it would blow from S.E. and E.

To any ship or person stationary upon the surface, I apprehend either the 1st or 2nd proposition would represent the apparent succession of cyclones, such as I have noticed above as prevailing in high latitudes.

With respect to the cyclones between  $25^{\circ}$  and  $30^{\circ}$  latitude, which are generally considered, I believe, to be those of the tropics recurring, I am induced to think that they only commence there; having several times in those latitudes on both sides of the Cape of Good Hope, though more frequently about the meridian of the Mauritius, found small whirlwinds arise, the wind blowing in sudden sharp puffs and always veering the way the regular hurricanes do in that hemisphere. The ship having gone round and round several times, and the puffs increasing in steadiness and duration, I have tried the experiment with success, of striking off from the centre, when on that part of the circle which should give me the wind I required.

May these cyclones not be formed by the descending winds from the tropical regions, which, meeting the surface with a greater rotatory velocity, thus acquire their south-easterly and easterly course? The theory I have advanced for the veering of cyclones in higher latitudes, would apply also to those in this zone.

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XIII.—*On certain Arid Countries, and the Causes of their Dryness.* By THOMAS HOPKINS, M.B.M.S., V.P. of the Manchester Literary and Philosophical Society.

*Read, April 14, 1856.*

It has been shown, in my former papers,\* that there are certain areas of condensation of aqueous vapour, within and near to mountainous regions of the tropics, towards which general winds blow from parts far distant, constituting what are commonly called the tropical trade-winds of the Atlantic and Pacific Oceans. The N. and N.E. winds that blow over the continents of Europe and Asia have also been pointed out as aerial currents flowing towards partial vacua, which are produced in areas of condensation, presenting, it is contended, evidence of the origin and nature of the disturbances that produce these great movements of the atmosphere. When winds which are dry pass over the surface of the ocean they readily take up moisture, and become charged with the vapour which is subsequently condensed, creating a vacuum, and producing rain at their termini. But when a partial vacuum in the atmosphere is thus produced, heavier air presses in, and flows, as a wind, from distant parts, not only over the ocean, but also sometimes over low-lands of continents, as we have seen that it does over the lands of Asia and Europe, giving to large districts of countries particular geographical characters.

These last-named winds are, however, not the only ones which blow from certain parts, where the air is dry, to other parts where it has been made light by condensation of vapour, although they are perhaps better known to Europeans than similar winds found in other quarters. In the northern portions of America, particularly during the winter, the air generally flows from the N.—from one part that is comparatively dry and heavy to another part which has been rendered light by condensation of vapour, brought by the tropical trade-wind from the Atlantic Ocean to the Gulf of Mexico. In the winter a wind generally blows southward across Canada and the United States, producing the cold climate of these countries. Various writers have described the intense cold of northern Canada. Lewis and Clarke mention the lingering of the winter cold on the Upper Missouri, and “the northers” blow fiercely in the winter into the Gulf of Mexico. The great mass of air, therefore, that passes over this continent in the winter flows southward to the Gulf of Mexico, in the neighbourhood of which, and against elevated land, the vapour that is at the same time brought from the Tropical Atlantic is largely

\* See ‘The Atmospheric Changes that produce Rain and Wind,’ Weale, Holborn.

condensed. Thus these two winds, North American and Asiatic, pass from regions where the air is cold and dry to localities where warm air brings copious supplies of vapour for condensation; and the dry winds thus brought tend to re-establish the equilibrium of atmospheric pressure which had been destroyed by the condensation.

A part only, however, of the vapour of the tropical seas passes into the Gulf of Mexico, as large portions of it turn northward, over the Atlantic as well as over the Pacific Oceans, which portions are condensed on the western coasts of Europe and America. But the air which contained the vapour does not, after that vapour has been condensed, return to the tropics over the same two oceans, as in neither of them do *north* winds prevail. The moist *south-west* winds of the Atlantic, after being deprived of a large part of their vapour by cold, return in a dry state over the low lands of the old continent; whilst the *west* winds of the northern part of the Pacific—after furnishing the rains of Western America—pass over Russian America and Behring Strait towards the Arctic Ocean, and return over the low lands of the central part of America as dry winds. Both of these land-winds are dry, because they have been deprived of much of their vapour, among mountains, by cold; and they afterwards pass from colder to warmer latitudes, which renders them more capable of taking up moisture: and they press and flow towards their termini, because there vapour has been brought from other parts by other winds, to be condensed and to create a comparative vacuum in the atmosphere.

Being in the northern hemisphere, these winds, with their peculiarities, are known to European meteorologists, but these meteorologists do not admit that *the prime disturbing cause is the condensation of vapour producing a vacuum in certain localities within the tropics*, as I have explained. In the southern hemisphere we have facts of a similar character, which are not equally well known. In that part of the world, as in the north, dry winds blow from cold to warm latitudes, giving a particular character to certain districts; and they also, as in the north, terminate in localities where a partial vacuum in the atmosphere has been created by condensation of vapour which has been brought from other parts. And thus we find that in both hemispheres cold and dry winds blow—not generally towards the equator as N.E. and S.E. winds, as is commonly assumed—but directly towards local areas of condensation of vapour, which areas are always found to be elevated lands, against which, at the same time, warm and moist winds also blow.

In the southern hemisphere there are not such broad continents as there are in the northern, yet the same flow of air over



land—rather than over water—from cool to warm latitudes, is observable in the former as in the latter. But there is ample breadth of ocean in the southern hemisphere over which a cold aërial current might pass from the Antarctic Ocean to the tropics, and thus restore the equilibrium of pressure in a disturbed atmosphere in the way indicated in the Hadleian theory of winds, if the causes of atmospheric disturbance recognised in that theory were those which are really in operation. Over the whole Southern Ocean, however, no palpable polar wind is to be found blowing to the tropics, such winds being confined to the comparatively small portions of land which exist in that hemisphere.

Four separate winds in the southern hemisphere may be traced, blowing from the s., in a way that makes them correspond with the dry northern winds in the northern hemisphere, giving a particular character to the countries over which they pass, namely, two in America, one in Africa, and one in Australia. And to these southern winds and their places of termination we may now direct our attention, in order to trace the prime causes of the disturbances of the atmosphere in this part of the world that produce such marked effects over extensive countries.

The first of these which may be noticed is the wind that blows along the low land of the western coast of South America. It is first found about Valparaiso, say in lat.  $33^{\circ}$ , blowing moderately, but it increases in strength as it proceeds towards the equator, passing over Chile and Lower Peru, until it reaches the province of Guayaquil, a place which may be described as being in the most southern part of a very rainy district, included between  $5^{\circ}$  s. and  $8^{\circ}$  of N. lat., into which much vapour is brought from the heated surface of the Bay of Panama, extending westward into the Pacific Ocean and the Mexican and Californian Seas. Now, if an atmospheric current is made to flow from the polar to the equatorial regions, in the way alleged in the Hadleian theory of winds, why have we not a s.e. wind blowing over the whole Southern Ocean between America and New Zealand, instead of the present limited Peruvian wind over a narrow strip of land? In this wide range of open sea, a w. wind of a decided character blows across the part s. of lat.  $38^{\circ}$ , and nearer to the equator a broad strip of calm occurs, until the eastern trade wind of the southern Pacific is reached; but over the whole of this extensive ocean no such s.e. wind is found blowing from the polar towards the equatorial regions, as would certainly blow there if the Hadleian theory were true. The south wind of Peru does not extend far over the sea, but clings to the land, passing along the western slope of the Andes until it reaches the region of condensation that has been named about the Bay of Panama. And this it does, although on the western side of the Pacific, among the lofty islands of Austral-

Asia and the Asiatic Archipelago, such condensation of vapour takes place as produces E. winds across both the South and North Pacific Oceans. The south Peruvian wind is at last to some extent absorbed by the great eastern trade wind, but this takes place within the tropics, near to the American coast, whilst no palpable S. or S.E. wind blows to the tropic in the open space between America and New Zealand.

Of the Peruvian line of coast Mr. Darwin thus writes,—“At Arauco, near Quiapa, the country never suffers drought, the climate being a happy mean between the dry parching heat of northern Chile or Peru, and the continued wet wind and chilliness of Chiloe. June 3. Northern Chile.—The whole country, from the coast to the Cordillera, is desert and uninhabited, from Yerba Buena to Carizal. Port of Iquique, lat. 20.—A slight shower of rain falls only once in very many years, and the whole country is utterly desert” p. 427. Captain FitzRoy says, “the city of Coquimbo is called ‘*La Serena*.’ In settled weather a fresh southerly wind springs up, a little before noon, and blows till about sunset. The usual strength of the southerly sea-breeze, as it is called, though it blows along the land from the S., is such that a good ship would carry double reefed top-sails. The coast of Peru is free from storms, the wind blows moderately along the land, or from it, and there is little or no rain”—p. 483. “The country is arid”—p. 481. “Point Jara, Lat. 23 S.—Neither water nor timber is to be had within 25 leagues of this place”—p. 209. Such is this line of country; and the dry wind continues to blow, giving the country, over which it passes, a desert character, until it approaches rainy Guayaquil, situated in 5° of S. lat.

The second American dry S. wind, in this hemisphere, is found on the eastern side of the Cordillera of the Andes: it therefore blows in a direction nearly parallel with that on the western coast, though not in the same latitudes. It commences its course not far from the Straits of Magellan, and passes over eastern Patagonia and the Pampas of Buenos Ayres, approaching the great region of condensation of vapour that exists on the eastern side of the Andes, and which furnishes the immense volumes of water that flow down the great La Plata and Amazon rivers. This extensive line of flat country, from the Straits of Magellan to the region of condensation named, is dry—like Siberia and Bokhara, in the northern hemisphere—indicating what is known to be the fact, that “the Pampero,” or Pampas wind, is itself dry; and it blows towards a region where the atmosphere must be made light by the large amount of vapour coming from the tropical Atlantic, that is known to be there condensed, forming a partial vacuum, into which the cool and dry air passes from the line of country that



has been pointed out. The dry air itself does not take sufficient vapour to produce a considerable vacuum at the place of its termination, nor does much rain fall, excepting among the Andes, to the south of say the 25th degree of latitude, in the countries over which the dry air passes. The vacuum that gives birth to this southern wind is, therefore, evidently produced by condensation of vapour, which is brought mostly up the broad valley of the Amazon from the tropical Atlantic Ocean; and that condensation, by producing an atmospheric vacuum, must be considered the prime disturber of the aerial equilibrium in this part of the world, which the influx of air from the south tends to restore. We thus see that in South America there are two south winds blowing along opposite sides of a range of mountains, towards two particular localities, where copious condensation is known to be taking place, whilst winds do not generally blow from the polar region, over the southern Pacific, towards the line of the equator.

Of the dry country north of the Straits of Magellan, Darwin says, "On the eastern side of the Cordillera, from lat. 38° to Tierra del Fuego, where a blue sky and fine climate prevail, the atmosphere has been drained of its moisture, and the arid plains of Patagonia support a scanty vegetation. The country near the mouth of the river (Rio Negro) is wretched in the extreme; water is extremely scarce, and, where found, is invariably brackish.—p. 73. The river Colorado, nearly 80 m. distant north, is separated by a dry desert. From the dryness of the climate, a man may walk for days together over these plains, without finding a single drop of water." And Captain FitzRoy states, that "From Cape Corrientes to Bahia Blanca is a long and dreary line of coast, without a river whose mouth is not fordable. And in the interior, but verging on the shore, is a desert tract, called by the Indians 'the country of the devil.' The most serious objection to this country is the want of rain. Generally a bright sunny day is succeeded by a cloudless and extremely clear night. Two or three years sometimes pass without more than a slight shower."—p. 105.

The third locality in this hemisphere, in which a dry region may be found, is Southern Africa; but we are not in possession of the same amount of information respecting this part that we have of South America, which fortunately has been visited by intelligent travellers. A large portion of South Africa is absolutely unknown to us, and the known parts have been little visited by scientific observers; we are consequently without much information of the hygrometrical state of the atmosphere in this country. Even the amount of rain that falls annually is unknown beyond the Cape district, and the immediate neighbourhood of a part of the east coast. We have, therefore, to infer the state of the atmosphere mainly from the water discharged by rivers. On neither the

eastern nor the western coast, from the Cape to about the sixth degree of latitude, are there such discharges of water as are found in America and Asia. It appears that the country does not rise to a sufficient elevation to produce copious condensation of vapour and consequent heavy rain, and therefore little water is borne to the sea by rivers. The dry central part of South Africa extends from a few degrees south of the equator to, say the 30th degree of latitude, and it is of an average breadth of, say 15 degrees of longitude, extending from about the 15th to the 30th degree of east longitude; yet in the whole of this large space no considerable river is found. The Orange and the Great Fish rivers occasionally send water freely to the ocean, and there are others on the eastern coast, but no large volume of water descends in any of them, nor are they navigable far from the sea. Those who have attempted to explore the interior have found the country generally dry, so much so, indeed, as to leave the explorers often greatly distressed through a want of water while passing from one small stream to another. There is not here that entire absence of water over a large area that is found in the great Sahara to the north of the Equator; nor does the country appear to be quite so destitute of that important article as is a large part of eastern Patagonia; but yet it may justly be called a dry desert country. The deficiency of water renders it almost inaccessible to explorers, and that deficiency is evidently the cause of such a small number of human inhabitants being found in it by travellers.

Captain W. Harris, in his *Wild Sports of Africa*, thus speaks of this geographical locality when in lat. 29° on the plains of the Vaal river. "In common with other countries remote from the sea-coast this portion of the continent receives its rain in thunder-showers during the summer months; and there being none during the rest of the year, the climate, notwithstanding frequent nocturnal dews, is characterized by extreme aridity. The sun shines with matchless splendour through a sky of delicate blue, which is rarely visited by a cloud."

Now, there can be little doubt that the cause of this country being in such a condition as that described is the same as that which has been traced in South America. The land in general is comparatively low, as it is in eastern Patagonia; but towards the north it becomes more elevated, and, as the equator is approached, mountains appear, some of which are so high as to be covered with snow. The Rev. Mr. Rebmann, during a journey in November, 1848, observed that these mountains are within 4° s. of the equator. "There are (he says) two summits rising to the limit of snow out of the common mountain mass. The eastern is the lower, and terminates in several peaks, the snow on which varies with the season. The western summit is the proper perpetual



snow mountain; it rises above its neighbour, and is formed like an immense dome. It is 10 or 12 m. distant from the eastern summit, the intervening space presenting a saddle."

This is about the locality which has been long noted on some maps as having perpetual rain; and towards this part winds blow from different quarters, some of them no doubt bringing the vapour which produces the rain. There does not seem to be any strong aërial current coming from the Indian Ocean, which lies to the east, and the coast of Zanguibar is known to be dry; but from the Gulf of Guinea and the Atlantic, a wind is stated to be always blowing, and generally with considerable strength. The tropical air in this gulf is of high temperature and very humid, being nearly saturated with vapour; and from the Atlantic Ocean, on both sides of the equator, this air rushes across the gulf towards the mountain region of perpetual rain, supplying the material for producing the rain and creating a partial vacuum in the atmosphere. But the mass of air which blows over the comparatively low country of Southern Africa from the neighbourhood of the Cape of Good Hope passes towards these mountains from cooler to warmer latitudes, and therefore will be dry in its passage. This dry wind is not so uniform, nor always of such strength, as that which is found in some other parts similarly circumstanced, as, no doubt, it is more or less disturbed in its passage by hills and ridges of land, but it appears generally to blow from the south. Now, air passing from  $30^{\circ}$  of s. lat. towards the equator would, at the level of the sea, be disposed to take up rather than to deposit moisture; to receive vapour through evaporation, rather than to furnish it for condensation; and as the country does not rise to any great height until the equator is approached, this mass of air passes over the continent of Southern Africa generally as a dry wind. Here, then, we see why South Africa is a desert country. Like Eastern Patagonia and the waterless desert of Peru, the winds that blow over it go from a cool latitude to a warm one; but they do this evidently because in the warm latitude a comparative vacuum is made in the atmosphere by an almost constant condensation of vapour which has come from another locality to a mountainous region.

It has been stated that little water is discharged by rivers from the southern part of this continent; but such a statement does not apply to the mountainous regions near the equator, and extending from it to the western coast, as a large body of water passes down the great river Zaire or Congo, as well as down other rivers which run westward from the mountains and enter the Atlantic to the south of the equator. We therefore have good evidence that in the central part of Africa there exists a region of condensation of aqueous vapour, which vapour is brought principally from the

Gulf of Guinea, and condensed among mountains, producing a vacuum, towards which the air from more southern parts presses and flows as a southern wind. And being carried into the vacuum, and ascending to a sufficient height, its own portion of vapour is cooled and condensed, increasing the vacuum, and augmenting the rainfall in the area. This course being continued and perpetuated makes Southern Africa the dry and barren country that it is, and so difficult to be explored by travellers.

The interior of Australia is little known, and therefore somewhat difficult to deal with. The few inhabitants who have gone from Europe to that country are generally settled on its coasts, or on the banks of rivers, the greater part of the interior being left in possession of the uncivilised natives who wander over its vast and almost barren solitudes. Various attempts have been made to discover the state of the interior parts, but they have ended in failure, rather from a want of the means of subsistence than from the hostility of the natives. The south-eastern are the parts principally occupied by European settlers, those parts being supplied with water; but, in proceeding northward, interminable plains are found which are little visited by rain. In its present state this part of the world does not yield subsistence to civilised man; it is, therefore, very difficult to explore, and undesirable to occupy. Such being the state in which this country is found, we are obliged to rely on facts which have come to our knowledge that have an analogy with others in better known countries. We have seen, in the parts already treated of, two features presented to our view that are common to them all, they being all traversed by dry air, and that air passing to localities of great condensation of vapour. And as Australia is found to be dry, like South Africa, Eastern Patagonia, and Western Peru, we naturally ask whether the cause which has produced the dry and barren state of these countries is to be found in active operation in Australia? In some of the more southern parts this is certainly not the case, as the falls of rain in them are equal to what are found in the better parts of Europe. And there are some extensive rivers, the Murray being navigable for hundreds of miles. But a very large portion of this country, say between the latitudes of  $20^{\circ}$  and  $30^{\circ}$  s., is, as far as known, without an adequate supply of water. Like the worst parts of South Africa, these extensive regions are exposed to a scorching sun unscreened by clouds, and scantily supplied with rain.

Sir Thomas Mitchell, in his *Travels in Australia*, says of this country,—“An almost perpetual sunshine prevailed; dry cirrocumulous clouds indeed sometimes arose, but no point of the earth’s surface was of sufficient height to attract them. There seemed neither on the earth nor in the air sufficient humidity to



support a cloud. Dew was very uncommon. The hot winds of the Bogan brought no antidote as in Sydney. On the Bogan (in lat.  $31^{\circ}$ ) the air was oppressively hot during the night" (vol. i. p. 31). Many other persons who have written of this part of the world describe it in the same manner.

Now north of this country, among the islands of the East Indian Archipelago, there exists an area of condensation of aqueous vapour probably equal in magnitude to any other on the surface of the earth. It has been shown in a former work that different currents of air saturated with vapour flow towards and terminate about these islands. These aerial currents come from the Arabian Sea on the one side, and from the China Sea on the other; from the Indian Ocean during the north-west as well as the south-west monsoons; and from the wide expanse of the Pacific Ocean, on both sides of the equator, almost without intermission. These currents of humid air produce heavy rains on and near to the lofty islands, which must create considerable atmospheric vacua into which the aerial currents rush and create ascending vortices, the process being constantly renewed and perpetuated. Presuming that in the interior of Australia there are no elevated lands up which moist air is made to ascend and condense its vapour, and thus determine a flow of air towards such lands, the atmosphere over this country would be impelled by its own weight towards the vacua over the islands, into which it would enter and ascend, leaving other air to follow in the same course, and constitute a general wind blowing from the south across the whole country. This is evidently what takes place, and it accounts for the dry wind that passes over Central Australia. As already pointed out, any wind passing from s. to n. in the southern hemisphere, moves from a cooler to a warmer latitude, and must consequently have its temperature raised by the greater power of the sun, thus making it a drier wind. And such a wind passing over land of only moderate elevation would not readily furnish rain; but, on the contrary, would be disposed to take up water by evaporation from any wet surface, and thus soon dry up any small streams which might descend from such hills as had produced a little rain. Hills, and even mountains, are said to exist on the north-eastern side of the country; and there may be some in the interior on which moderate rains fall, relieving the general state of dryness; but these, from all the accounts given, seem insufficient to counteract the great effect produced by condensation of vapour over the large and lofty islands of the Archipelago, which leaves the central plains of Australia dry, scorched, and barren, like the Great Sahara of Northern Africa.

It may, however, be observed, that at the commencement of the dry lines of country in the southern hemisphere, that have

been described, rainy districts exist. The Cape of Good Hope has a considerable supply of rain; Van Diemen's Land is a wet country; and Tierra del Fuego and Western Patagonia have drenching rains that hardly ever cease falling, summer or winter. The vapour which is known to be abundant over the wide extent of the Southern Ocean is therefore to a certain extent condensed in these mountainous countries, and ascending atmospheric currents, more or less strong, must be formed over them. The air in these localities may, therefore, be deprived of some of its moisture before it passes towards the tropics; and it is very likely that this dried air descends and flows over the arid lines of country that terminate in the tropical localities of great condensation of vapour. Were there no elevated lands at the three last-named places, the air to the north of them would probably have more vapour than it now has, and might resemble that which flows over the continent of North America, which has a certain degree of dryness, because it passes from a cool to a warm latitude, rather than from having had its vapour condensed by ascension of mountains at its northern extremity. The extreme southern rainy localities may, therefore, make the winds which are passing from them drier than they otherwise would be; but it is the large amount of condensation of vapour, and the consequent vacuum at the terminus, that create the dry aerial current in each locality.

The four southern countries that have been described have, then, all the same geographical features of climate and character; and these features are evidently determined by the particular winds which blow over them. And the general characters are the same as those of other countries formerly examined by me in other papers, that is to say the deserts of Bokhara, Persia, and Arabia, and the great desert of Northern Africa. In all these parts, dry winds blow towards localities, known to be areas of condensation of vapour, and therefore where comparative atmospheric vacua must be created; and no cause, but these vacua, seems to be capable of producing the winds. A general flow of the atmosphere in the lower regions, from cold to warm latitudes, would not create local winds, blowing to particular points or areas, but would cause the air to pass over the extensive low level of the ocean towards the equator in a uniform manner and direction.

In July, 1853, at a meeting of an American Association for the Advancement of Science, a paper was presented by Mr. L. Blodget, in which, among other things, it was stated that, in the western part of Texas, "*a monsoon* blows from May to November, day and night, for months together, over the whole district bounded by the Rio Grande and the San Pedro and Pecos on the s.w., and merging gradually in the low plain of Texas on the e." This wind is claimed as "*a true desert monsoon*, and analogous



to the desert winds of Africa and Asia." And it is asserted to be "a non-precipitating wind, increasing in temperature and rarefaction, and exhausting itself in a rainless district beyond which it does not extend." This part was previously almost unknown to European meteorologists: the facts are therefore interesting. The locality described appears in the summer to have the character of a dry desert, and to be similar to the lines of country in the S. that have been traced. But Mr. Blodget says that the dry winds exhaust themselves in a rainless district! Is this only a *belief*, such as is so often entertained, and therefore announced as a fact? or is it an *ascertained* fact? The wind is described as blowing in the summer season from the S.E., and of course from the Gulf of Mexico, over low land, towards the high Rocky Mountains, among which all the great rivers extending from the Red River to the Missouri take their rise. Now these rivers are known to be supplied with water to such an extent as to prove that heavy rains must fall about their sources, and winds blow up the valley of the Mississippi constantly during the summer, bearing, as may be presumed, the vapour which is condensed among the Rocky Mountains. The probability therefore is, that this south-east monsoon, which passes *over* a rainless district, blows to the area of condensation, at the sources of the rivers, among the mountains. Further accounts may show whether this locality forms an exception to many others that have common characters, or that Mr. Blodget had observed only a part of the phenomena open to his examination, when he supposed he had seen the whole. When a dry wind blows into a vacuum among mountains, produced by vapour brought from another quarter, the wind may enter the vacuum at a considerable elevation, and in the latter portion of its course may not be palpable near the surface of the earth: this seems to be the state of things between the desert of Scinde and the Himalayan mountains. But if heavy rain falls in a locality towards which a dry wind blows, we may safely infer that it blows towards a rain-made atmospheric vacuum. Should the part described by Mr. Blodget prove to be a district made rainless in summer, by condensation in the country to the north of it, it will prove a striking instance of the power of vapour to cause a wind to blow towards the place where its condensation is occurring. The vacuum about the sources of the Missouri would be proved to be sufficient to draw air even from the Mexican gulf, in opposition to the powerful influences that exist in other parts around that gulf, and also to make the air pass northward over the rainless district described.

It is generally asserted in meteorological works, in accordance with the Hadleian theory of winds, that in the northern hemisphere, the polar aerial current returns to the tropics as a north-

east wind, until within the tropics it becomes an east wind. But this is not correct, even as far as respects the land in Asia, a part long known, as over Siberia and Bokhara it is north, in Persia and Arabia it is a general north-west wind, and blows as such in the winter over the Arabian Sea and the Northern Indian Ocean. Up the Valley of the Nile the perennial wind blows from the north. Over the immense extent of the flat Sahara the predominant direction of the movement of the atmosphere, fitful and irregular as it is, is towards the Rainy Mountains near the equator; and this direction is changed in a decided manner only at certain times when the "Harmattan" prevails; this temporary wind being now known to be produced by tornadoes in the Equatorial Atlantic. What is called the "eastern trade wind" in the Northern Atlantic, as has been shown, is caused by condensation of vapour against the Cordillera of the Andes.

In like manner, the wind that passes over the middle of the continent of North America in the winter, the time when the polar winds are supposed to be the strongest, blows from the north, but is more inclined to become a western than an eastern wind. Where this wind is first found, near the mouth of Mackenzie River, the most western part is in about the 130th degree of west longitude, whilst at the southern terminus in the Bay of Mexico and the West Indies, the most western portion does not go beyond the 100th degree of west longitude. And it often blows over the United States to the eastern coast, as a north-west wind, making that country very cold in the winter. There is certainly a barrier to this wind in the Rocky and Mexican Mountains, along the eastern side of which it blows, as a "norther," into the Gulf of Mexico; but this does not alter the fact of the wind being generally a north-west, rather than a north-east wind, blowing from the polar to the tropical regions. And what is the state of the atmosphere on the western side of this barrier? Is a north-east wind found there? No—the whole mass of air is in motion across the Northern Pacific, not from the north-east, the direction in which theory has represented the polar winds as blowing in the northern hemisphere, but directly from the west. A strong western wind blows in the Northern Pacific, up to about 60° of latitude, bringing heavy rain to the whole American coast.

Whilst no north-east wind blows over the Northern Pacific, it is well known that westerly winds generally prevail in the northern part of the Atlantic, leaving the aerial polar currents to pass towards the tropics over land alone, as in fact they generally do, in the way already described: and these various winds show us, pretty clearly, what are the great movements of the atmosphere in the northern hemisphere. In southern parts, beyond the tropics, no decided south-east wind is found. With small exceptions, the whole of this portion of the surface of the globe, south of 38° of



latitude, is ocean; but in no part have we a south-east polar wind, such as, in the common theory, is said to exist. In this hemisphere, outside of the tropics, there is not much elevated land to produce condensation of the vapour that is so abundant over the Southern Ocean, and therefore masses of air are not so extensively transferred from one latitude to another, as in the northern hemisphere. Air must nevertheless be cooled in the southern polar regions, but it passes towards the tropics over land, and not over the ocean. The tropical trade winds of the Atlantic and Pacific Oceans are then those which alone remain to countenance the Hadleian theory, as they, no doubt, originally suggested it. But the causes of these winds have been clearly shown to be condensation of vapour against the elevated ridges of the tropical Andes, and the lofty islands of the East Indian Archipelago. And it has also been proved that mountains within the tropics produce west winds, as in the Gulf of Guinea, and on the western side of the Eastern Archipelago; and this could not take place if the Hadleian theory were true.

In treating on the subject of particular winds, and tracing their proximate causes, considerable difficulty is experienced in distinguishing, with simplicity and clearness, those that are local and temporary, from others that are more general and comparatively permanent. Of the former it has not been proposed to treat in the present paper, but still it is desirable to observe, that over very large portions of the earth there are numerous local causes of disturbance in the atmosphere, that produce limited and temporary effects. In addition to, and apart from these, however, there are, about certain elevated lands, causes of greater and longer continued disturbances, which make them more or less permanent; and some of these have been more particularly considered in this paper. But in order to obtain a clearer view of the working of these causes, it becomes necessary to pass over numerous small and temporary disturbances, which more or less interfere with the larger and more permanent, and always force themselves on the attention of casual observers. To introduce and discuss these in detail, at the same time that we are considering the special results on the earth's surface of more important disturbances, would however produce complication, render the subject more tedious and difficult to understand, and involve it in an obscurity which does not belong to it. The general laws, or principles, which govern the changes that take place in our atmosphere, are not very obscure or complicated; though, perhaps, they may appear to be so, from only occasional observations of the phenomena, and from the way in which the subject is geneally treated. Yet, in this respect, meteorology does not materially differ from other sciences, some of which were formerly equally obscure. Chemistry in the hands of the alchemists was as chaotic and incomprehensible as

meteorology is at present. And to ancient astronomers, not having the clue to assist them, which a knowledge of the laws of gravity affords, the heavenly bodies appeared to dance through the heavens in complicated and involved figures that defied analysis. But the laws of combination in definite proportions in the one case, and of the mutual attraction of ponderable bodies in the other, have furnished means of rendering that which was formerly a mass of confusion or obscurity, comparatively clear and simple. And the different laws of cooling by expansion of the constituents of the atmosphere, and those which govern heat in its chemical union with, and separation from, water, when properly understood, seem to afford equal evidence of the nature of the changes which are ever taking place in our atmosphere.

Under the operation of these laws, certain localities have great influence in producing motion in the atmosphere, and creating the general currents in it which determine its circulation. Over the ocean, evaporation is constantly taking up vapour, which by its elastic force expands and diffuses itself through the gases; and the amount of heat thus taken up, to be afterwards used in expanding the gases in particular localities, is enormous. Through a difference in the laws of cooling, by expansion, of vapour and gases, this heat would, in all parts, be given out at certain heights, when the cold of the gases condensed the vapour, and rains would fall with considerable uniformity. But as there are certain elevated lands distributed over the surface of the earth, against these the vapour is largely condensed, and towards these lands atmospheric currents flow, or winds blow, producing continuous aërial movements, and ascents in the area of condensation. The ascents cause a boiling up and overflowing of large masses of the atmosphere, in the higher regions where they diffuse themselves, and in time descend, perhaps in parts far distant, or they may press upon and put in motion other parts beneath them.

Many of these localities of condensation have been pointed out in this as well as in former papers, but they may be here brought together in an order relating to their importance. The first that may be named is found on the eastern side of the lofty Andes, where the rivers La Plata, Amazon, and Orinoco have their sources. The second is in and about the Himalaya Mountains, from which all the great rivers of Southern Asia take their rise,—the Indus, Ganges, and Brahmaputra in Hindostan; the Hoang-ho, and the Yang-tse-kiang-keou, in China; and many other large streams. The great Asiatic Archipelago is the third locality, though there are no large rivers there to mark the amount of condensation. The tropical African Mountains may be next named, from which flow the Nile to the north, and the Congo to the west. The Rocky Mountains of North America, and the mountains of Chile, Western Patagonia, and Tierra del Fuego,



come next in order, as areas of condensation, to be followed by the Alps and other mountain chains of central Europe, and the Scandinavian and British mountains. Over all these mountainous countries aqueous vapour is largely condensed, giving particular characters to the respective parts; and the atmosphere is made to boil up and overflow at each place in proportion to the amount of vapour brought for condensation, and the height to which the vertical current ascends. The air discharged above, in due time comes down to the surface, and thus a general circulation of the atmosphere is established.

Direct heating, by the sun, of the surface of the globe, and consequently of the air that rests upon it, would, there is no doubt, as stated in the Hadleian theory of winds, produce to a small extent movement of the atmosphere, if it were not moved by a more powerful force; but that heating would take place gradually from one latitude to another, and by insensible gradations; the circulation of air therefore which would take place from this cause alone would be slow, regular, and feeble. When dry air, in consequence of being heated by the direct rays of the sun, now ascends in the atmosphere, it is soon cooled by expansion; and as it takes no supply of latent heat with it, to be given out when cooled, it soon acquires the temperature due to the elevation, and little disturbance is produced. As explained formerly, there is no evidence that dry air ascends over hot plains to any considerable height, nor that cool air comes in quantities to such plains, as a fresh supply to be successively heated and raised. It is not denied that any even the slightest local heating will expand air, when it will be pressed up by adjoining heavier air, in proportion to the expansion, nor that heated tropical air is to some small extent forced upwards by cool polar air. This is admitted to be true both in theory and in fact; but it is contended that it must be a slight and mild operation, and among the violent disturbances which often take place in our atmosphere can scarcely be traced.

Over the Caribbean Sea clouds have been observed in the higher regions, moving in a direction opposite to that of the wind below, and these observations have been often quoted as evidence in favour of the Hadleian theory. But these appear to be only some instances of the expansion and flow of air from very rainy localities, where it has been made to boil up by successive condensation of ascending vapour. The precise courses of upper currents are not known, but there is reason to presume that they generally flow towards the parts where the lower currents are found to commence. When clouds are seen to pass over the Caribbean Sea towards the *E.*, whilst a wind is blowing below towards the *W.*, it may be presumed that the upper current is passing towards that part of the ocean where the *S.E.* trade wind is first found as a dry wind, which is over the Atlantic at some distance from the Canary

Islands. There does not appear to be any palpable flow of air near the surface to feed this trade wind at its commencement, and therefore it may be presumed to be fed, at least partially, by descending air, which had been previously deprived of its moisture in higher regions. Such descended air soon flows over the surface towards an area of condensation, and if this should involve passing over cooler towards warmer latitudes, as the air does over the countries treated of in this paper, the parts will partake of a desert character, and might be marked as such on our maps in connection with the aerial currents, presenting a more satisfactory representation of the greatly varied surface of the globe than is to be found at present.

It is desirable that travellers exploring a country which is but little known should particularly observe certain natural phenomena connected with the atmosphere. Wind generally arrests attention to some extent, but there is not much care bestowed in describing the different kinds of winds that are met with. It is important to ascertain as far as possible the general direction in which the mass of air is moving, and whether the wind is feeble, moderate, or strong. If it should be slight and continuous, it may be presumed that the disturbing cause is operating at a considerable distance; whereas, if it is strong, and also fitful, the probability is that the cause is near. The general wind is, however, frequently broken in upon by local movements of the atmosphere, and the direction, strength, and duration of these movements should be estimated and noted, in order to furnish the means of judging respecting the locality of the disturbance and its character there. A thermometer is generally taken by all travellers, and it would be easy to have a wet bulb attached to the same frame with the dry bulb thermometer. A registration of the former with the latter, would indicate the hygrometrical state of the air as well as the temperature. A record of these instruments at sunrise, and at the hottest period of the day, say 1 or 2 P.M., would show the local changes of vapour as well as of temperature, would materially add to our geographical knowledge, and might enable us to account for peculiarities in the conditions of countries, as well as to judge of others that have not been explored. Had such information been furnished by those who have partially succeeded in penetrating the interior of Australia, it might materially assist future explorers both in determining the direction in which they should proceed and the probable kind of country they should find. The atmosphere generally is in motion over the country, and more or less indicates its condition: the atmospheric peculiarities and changes should therefore be carefully noted and recorded.

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XIV.—*Explorations through the Valley of the Atrato to the Pacific, in Search of a Route for a Ship Canal.*

By direction of F. M. KELLEY, Esq., of New York.

Communicated by the SECRETARY.

*Read, April 28, 1856.*

IN treating on the various facilities for connecting the Atlantic and Pacific Ocean, by a canal through the Great American Isthmus, Baron Humboldt drew attention nearly fifty years since, to the course of the Atrato and its tributaries, and to the depressions said to exist in the range of mountains between that river and the Pacific.

The growth of commerce in the Pacific, since the discovery of gold in California and Australia, has produced a large traffic both of passengers and goods across the Isthmus; leading to the formation of the Panama Railway, and to an active use of the waters of Lake Nicaragua and its outlet, the river San Juan del Nicaragua. Surveys have been effected at Tehuantepec, and from the Gulf of Honduras to Fonseca Bay. An endeavour, supported by the governments of Great Britain, France, and the United States, was also made to survey the Isthmus between Caledonia Bay and the Gulf of St. Miguel. In the papers of Captain Robert FitzRoy, printed in the Journals of this Society, other routes are described or proposed, but it is unnecessary to add further to this general view of the subject, than to observe that none of them have presented facilities warranting the construction of that great desideratum, a navigable passage between the two oceans.

No material additions to our knowledge of the Atrato River had been made, since Baron Humboldt drew attention to it, until the year 1852. In that year, Mr. Kelley of New York, impressed by Baron Humboldt's reports in favour of the Atrato, resolved on causing a survey of that river to be made, including the routes between it and the Pacific, for the purpose of determining whether a ship canal could be constructed in that quarter.

At the expense of Mr. Kelley and other gentlemen, a surveying party, equipped with proper instruments, was despatched to the Atrato, under the direction of Mr. J. C. Trautwine, a civil engineer of Philadelphia, who had previously been engaged in superintending the formation of the Panama Railway.

Mr. Trautwine surveyed the mouths of the Atrato and the course of the river to Quibdo, where the Atrato is joined from the west by the River Quito. During his ascent of the river, Mr. Trautwine also partially examined several of its tributaries as he arrived at their mouths.

Above Quibdo, Mr. Trautwine directed his attention in the first place to the River Quito and its tributary the Pato; and having ascended the Pato to its source, he crossed the dividing ridge to the River Bando, which he descended to its mouth on the Pacific. Returning from thence to Quibdo, he retraced his steps along the Bando, as far as its confluence with the Pápé. Here he changed his route, by ascending that river to its source, crossing the dividing ridge to the River Surucco, one of the head waters of the San Juan, and proceeding along the last named river to Quibdo. In proceeding from the San Juan to Quibdo, he crossed the water parting, said to be intersected by the Raspadura Canal. But no such work was known in the neighbourhood, and the passage to Quibdo, from San Pablo on the San Juan, across this ridge, which divides the waters of the Atlantic from those of the Pacific, follows the course of the Santa Monica, the San Pablo, and the Quito; names by which the western branch of the Atrato is designated at successive portions of its course. This route was again traversed by Mr. Trautwine, in a journey from Quibdo along the San Juan, to its mouths at Chirambira, on the Pacific, from whence he proceeded to the adjacent anchorage of Buena Ventura, and returned home by way of Panama, in the month of September, 1852, having entered the Atrato in June. During this journey, astronomical observations for latitude were made as often as the usually obscured state of the heavens would allow. Altitudes were taken by the spirit level and barometer, the width of the river by angles from a measured base, and distances along the streams by repeated observations of the rate of the boat's passage. The depth of the streams, velocity of the current, and rise and fall of the water, were also observed; and generally whatever could contribute to a knowledge of the country, and the specific object of the expedition.

In 1853, two parties were despatched at the sole expense of Mr. Kelley, under Mr. Porter and Mr. J. C. Lane, civil engineers of New York, for the purpose of following up Mr. Trautwine's labours. Mr. Porter's investigation extended, along the Atrato and Quito, to San Pablo on the San Juan; the route previously taken by Mr. Trautwine, whose observations were fully confirmed by the levels and surveys of his successor. Mr. Lane also examined the Atrato to Quibdo, and from thence took the eastern route along the Atrato to the Andágueda, from whence he crossed the dividing ridge to the San Juan, and declared it to be impracticable. Mr. Lane also examined the Raspadura, and confirmed by his own observation the reports previously given by the inhabitants to Mr. Trautwine.

These expeditions, well supplied with instruments, furnished ample information concerning the Atrato from its mouths to its



head-waters, and across the intervening summits to the rivers Bando and San Juan.

The Atrato falls into the Gulf of Darien through nine mouths called "bocas" or "caños" intersecting an extensive swamp. They are named from west to east, Taréna, Candelária, Páva, Matuntúbo, Coquito, Coco grande, Pántano, Urabá, and Piguindé. Bocas Tareno and Matuntubo discharge much larger volumes of water than any of the others; but the Boca Coquito appears to offer superior facilities for improving the navigation.

For 96 m. above the Boca Coquito, measured by the windings of the river, the width of the Atrato is generally between 750 and 1000 ft. Throughout this distance, the channel is also sufficiently deep for the largest ocean steamers and sailing vessels. At the River Sucio, 61 m. above Boca Coquito, the width is 1050 ft., with a low water channel of 50 ft. in depth. Seventy-five m. above Boca Coquito the width is 950 ft., and the depth 45 ft. In many intermediate spots, soundings were taken at 60 to 75 ft. It must be remarked that the river was lower at this time than it had been for 20 years. The ordinary height of the water is indicated by a line along the banks, below which no grass grows, and this line was 3 to 4 feet above the water, near the confluence of the Napipi.

It was generally impossible to measure base lines on shore for determining the width of the river, on account of the soft mud and dense vegetation, as well as the detention of the boat laden with merchandize. On this account, the length of the boat, 68 ft., was taken as a base line; and at every stoppage for meals or other purposes, Mr. Trautwine and his assistants took simultaneous angles from each end of the boat to some well-defined object on the banks. The instruments were graduated to minutes, and errors are estimated to be within 10 or 20 ft. Whenever it was practicable, base lines were measured on shore.

Opposite Quibdo, at a distance of 220 m. above the Caño Coquito, the Atrato is 850 ft. wide, with a current varying from 2½ to 3 m. per hour, and a depth varying from 8 to 20 ft. The fall of the river from Quibdo to the sea is less than 3 in. to a m. Steam navigation might be extended as far as the confluence of the San Pablo and Certigui, 32 m. above Quibdo. Twenty-one m. above the mouth of the Certigui is the confluence of the Raspadura and Monica, which unite to form the San Pablo. At this point the navigation is limited to a boat channel of 10 to 20 ft. in width, and usually 3 to 4 ft. in depth.

The Raspadura was reported to Baron Humboldt, as having been made into a canal by the curate of Novita in 1788; but it proves to be an inferior stream to the Monica, and the recollection of any such work does not exist in the neighbourhood. It is quite probable that a curate interested in the boating-business, may

have exercised sufficient influence over some of the gold-hunting members of his flock, to induce them to cut down a few bushes, and to hollow out a short gutter, between two streams flowing in contrary directions from the summit. Such a ditch may have been used as part of a canoe-slide from one stream to the other; and precisely the same kind of canal could now be made by a dozen expert labourers, in a few days.

The Raspadura has been abandoned by travellers for some years, and is superseded by the Santa Monica. Along the latter stream, the line of levels showed the lowest summits between the Atrato and the San Juan, to be 183 ft. above the San Juan at San Pablo, and 80 ft. above the head of the canoe navigation on the Monica.

The width of the San Juan at San Pablo is 450 ft., the depth 5 ft., and the current, 3 miles per hour. The length of the river from San Pablo to the Pacific at Chirambira is 123 miles. It receives several tributaries which are named in Mr. Trautwine's map, contains several islands, and terminates in a sandy bay, through a swampy delta.

The dividing ridge between the Pato and the Baudo offered still less inducements for a ship canal, the summit being at least 700 ft. above the Pato, while the descent to the Baudo was extremely precipitous, passing for about a m. along a path varying in breadth from 2 to 8 ft., with vertical precipices on each side, descending to a depth of from 50, to more than 200 ft. These precipices consisted of clay and gravel; but they support a vegetation not only of grass and shrubs, but also of full sized trees, and their permanence can only be due to the absence of frost.

The Baudo proved to be navigable, with an average breadth of 200 ft., but terminating in a bay which is only 4 to 9 ft. deep over its whole area.

This examination of the heads of the Atrato, and of the dividing ridge separating its waters from those flowing into the Pacific, as well as the unfavourable nature of the latter, dispelled the prospect of a ship canal in that direction, and limited further inquiry to the lower parts of the river.

During Mr. Lane's sojourn in Quibdo, his attention was directed to the River Truando, by some Indians who had arrived at Quibdo from the Pacific, by that route. His consequent preliminary examination of that river, proved to be so favourable, that another expedition for accomplishing its survey was resolved on.

In the year 1854, Mr. Lane was therefore despatched by Mr. Kelley, with four assistants provided with instruments and a full equipment, to examine the Truando. He ascended as far as Townsend junction, 38 m. from the confluence, and reported the Truando to be 150 ft. wide, and 15 ft. deep up to that point, and



flowing through swamps. A fever contracted at Aspinwall on the way out, prevented him from pushing through to the Pacific.

In November, 1854, another expedition under Mr. William Kennish, accompanied by Mr. Norman Rude and Dr. R. G. Jameson, was despatched by Mr. Kelley, with instructions to commence operations from the side of the Pacific. The coast was to be followed from Panama Bay, southward as far as the latitude of the Truando in  $7^{\circ}$  N.; with a view to the discovery of a harbour, and of any depressions in the range of the Cordillera, which would admit of an open cut, without locks, between the two oceans. Observations presenting any prospect of such a result, were to be followed by a thorough survey; for which the proper instruments and means were provided.

Mr. Kennish penetrated Darien Harbour as far as Chapigana, where he obtained the assistance of Mr. Nelson, who resides there, and of a pilot acquainted with the coast. Another pilot was also engaged at Garachine. Behind the village of Garachine, the mountains rise to the height of 3000 ft. and pass southward, following the coast to Puerto Pinas, where their elevation is but little diminished. The mountains are covered with dense forests, from the margin of the sea to the highest visible part of the range. No harbour for large vessels occurs southward from Garachine Point, until Puerto Pinas is reached. This harbour is  $2\frac{1}{2}$  m. wide at the mouth, and extends inland for 5 m. It is closely hemmed in by mountains, densely wooded, and rising to the height of 300 to 1000 ft. The more distant ranges in the interior appear to rise above 3000 ft. A steep hill was ascended with great difficulty, and its altitude observed to be nearly 500 ft. The foliage rendered it impossible to obtain a prospect beyond a few yards, and this difficulty occurred throughout the route.

The coast between Puerto Pinas and Punto Ardita is bold and rocky. There are two remarkable promontories—the northerly is called Punto Muerto, the southern is Punto Caracoles. In the vicinity of these points the small coasting vessels find anchorage. Punto Cocalito is another similar promontory, about 6 m. from Punto Ardita. At Punto Ardita, commences the bay which receives the Yurador and Paracuchichi rivers and others of less note. Here also a remarkable depression of the Cordillera, from altitudes of thousands of feet to only a few hundreds, presented a feature which it was determined to explore. The bay is bounded on the s. by the remarkable promontory of Cape Marzo, distant 35 m. from its northern limit at Punto Ardita. The depth of the bay, from a line connecting the two headlands, is 15 m. The coast-line is formed by three great *playas* or sandy beaches: the first of which, forming a segment of a circle, extends from Punto Ardita to the mouths of the Yurador; the second continues in a

straight line from the Yurador to the Paracuchichi, a distance of 10 m.; the third extends, in a semicircular form, to the mouth of the Corredor River, a distance of 15 m.

The waves of the Pacific break in long continuous lines of surf against these elongated beaches, from whence the water deepens very regularly and gradually, affording anchorage in 10 to 30 fathoms, on a sandy bottom, within 2 or 3 m. of the shore.

Off the points of Ardita, Yurador, and Marzo, there are detached rocks, but all other parts of the bay are free from obstruction.

At Corredor, an indentation of the coast forms a safe anchorage and harbour, where large ships can find protection from nearly every wind, within a distance of 7 or 8 m. from the mouth of the Paracuchichi.

After an unsuccessful attempt to enter the Yurador, the party landed at Corredor, from whence, with the aid of a resident pilot, a bongo was navigated through the surf into the Paracuchichi. From the mouth of this river a spacious inlet was found extending northwards like a fine inland lake, with a perfectly smooth surface, 4 miles in length, and 250 to 500 yards in breadth at low water. The peninsula which separates it from the ocean is so densely covered with cocoa-nut palms and other tropical vegetation that it can only be traversed by beaten tracks. It is about 10 miles long and 300 to 500 yards broad. On the mainland the inlet is bordered by mangrove, distinguished by the extreme hardness and durability of its wood, and suitable for piles.

The inlet is not laid down on any chart. It is situated in  $6^{\circ} 57' 32''$  north latitude. The temperature was cool and agreeable. The thermometer ranged from  $84^{\circ}$  at noon to  $70^{\circ}$  at night, and the aneroid barometer from 29.35 to 29.42.

Towards the north the inlet narrows. During high tide canoes can pass to the southern mouth of the Yurador, but at low water a mudbank connects the peninsula with the main. The highest tide observed at Paracuchichi, at spring and neap, was 12 ft. 6 inches, and the lowest, 10 ft. 11 inches. The surface of the peninsula is several feet above the highest tide; and the inhabitants have no recollection of its having been inundated.

The peninsula thus forms a permanent breakwater, sheltering a beautiful and tranquil inlet, almost adapted by nature to serve as a dock or harbour, and suitable in every respect for the terminus of a canal.

Violent storms are almost unknown in this part of the Pacific. The line of surf extends outwards about 100 yards. It is a common feature in the Pacific, and is more formidable in appearance than in reality, especially on a bottom of sloping sand. A boat can pass through it safely.



The capabilities of the Kelley-inlet, the existence of good anchorage in the offing, and the harbour at Corredor in the vicinity, concurring with the extreme rarity of storms on this coast, tended materially to encourage the prospects offered by the great depression in the Cordillera, and to justify the exploration of a route from this point to the Atrato.

Accompanied by some natives, the party entered the small river Mary, up which the tide ascends for 2 miles, when it becomes quite shallow. A mile and a quarter beyond the tidal reach, it receives a small tributary from the north-east, along which the route proceeded to a spot called "Dos Bocas," at the junction of another stream. Passing over a hill between the streams, the party came to the Chupipi, a tributary of the Paracuchichi, flowing from s. to s. After crossing a succession of clay hills, the Chuparador was reached, flowing also into the Paracuchichi. A short distance beyond, the last stream flowing into the Pacific was observed, and, crossing the summit at a height of 540 feet, the Hingador was found, descending over a series of falls to the Nerqua, a tributary of the Truando. The distance of the summit from the Pacific is 10 m. and 750 yards. The Nerqua was descended in boats to its confluence with the Truando, along which the party proceeded to the Atrato. After ascending the Atrato to Quibdo, Mr. Kennish returned to the Truando, and pursued its survey from its mouth to the Gulf of Darien. The map and section deposited with the Society show the course of the Truando, together with the route through the depression of the Cordillera, according to the survey and levels made by Mr. Kennish.

Mr. Kennish proposes to enter the Atrato by the Caño Coqueto. The greatest depth on the bar is about 4 ft. at low water; the soundings gradually deepen, and become 30 ft. within 2 miles, when the depth increases to 47 feet, and is nowhere less up to the Truando. The width varies from a quarter of a mile to 2 miles, and the removal of the bar would allow of the transit of the largest steamers. The confluence of the Truando is about 63 m. from the Gulf, and that river forms the channel of the proposed line for 36 miles. The line then follows the valley of the Nerqua through rock-cutting, and passes the summit by a tunnel of 3½ miles. It reaches the Pacific through the valley of a small stream, and débouches at Kelley-Inlet.

In the valley of the Atrato, 300 miles long and 75 broad, and lying between the Antiochian mountains on the e. and the Cordillera of the Andes on the w., rain falls almost daily; which accounts for the immense supply of water in that region. On the Pacific side of the Cordillera there is scarcely any rain for eight months of the year.

The greater portion of the rain falling in the Atrato valley, is caught above the confluence of the Truando. Fifteen large tributaries and numerous smaller streams fall into the Atrato and contribute to the immense lagoons, which form natural reservoirs and a superabundant store of water throughout the year.

There are various cogent reasons for selecting the confluence of the Truando as the best point from whence the passage from the Atrato to the Pacific may be effected.

In the first place, there is no point of junction with the Atrato by western tributaries, so near the level of high water on the Pacific as that of the Truando. It happens to be 9 feet above the Pacific at high water, and it is therefore of sufficient elevation to prevent the Pacific at high water from flowing through the proposed cut into the Atrato; while it is not so high as to cause the current from the Atrato to the Pacific at *low* water to pass through the cut too rapidly. In fact the elevation of the Truando confluence just preserves a preponderating balance on the side of the Atrato.

The Atrato, at the junction of the Salaqui, is only one foot above the level of the Pacific at high water; but the dividing ridge is 1063 feet high and 30 miles wide, according to a survey of that route by Mr. Kensish and Mr. Nelson.

Should any of the rivers at the mouth of the Atrato be selected, without reference to the height and width of the dividing ridge, it may be observed that the maximum tidal wave in the Pacific being 25 feet and that on the Atlantic only 2 feet, the Pacific at high tide would flow into the Atlantic with a current equal to a head of 11½ feet; and at low water in the Pacific, the Atlantic would flow into it with a similar current. In the inlet of the Gulf of Miguel, recently called Darien Harbour, the action of the tide is so strong, that n.u.s. steamship 'Virago,' commanded by Captain Prevost, dragged both anchors ahead, and was only brought up by paying out nearly all her cable.

The height of the tides and the levels of the two oceans have been well established by the recent observations of Colonel Totten in Navy Bay on the Atlantic, and in a deep bend of the Bay of Panama on the Pacific. On the Atlantic, a consecutive series of 32 observations was taken in the months of August and September, during the season of calms. On the Pacific, two sets of observations were made. The first, during May and June, when 54 consecutive tides were observed in a season of calms; and the second in November and December, when 52 consecutive tides were observed in a season of light winds. The results of these observations, which do not exactly correspond, are given in the following table:—



	PACIFIC.		ATLANTIC.
	May and June.	Nov. and Dec.	Aug. and Sept.
Greatest rise of tide .. .. .	17.72	21.30	1.60
Least .. .. .	7.94	9.70	0.63
Average .. .. .	12.08	14.10	1.16
Mean tide of Pacific above mean tide of Atlantic .. .. .	0.759	0.140	
High spring tide of Pacific above high spring tide of Atlantic .. ..	9.40	10.12	
Low spring tide of Pacific below low spring tide of Atlantic .. .. .	6.55	9.40	
Mean high tide of Pacific above mean high tide of Atlantic .. .. .	6.25	6.73	
Mean low tide of Pacific below mean low tide of Atlantic .. .. .	4.73	5.26	
Average rise of spring tides .. .. .	14.08	17.30	
Average rise of neap tides .. .. .	9.60	12.40	

These observations make the mean level of the Pacific from 0.14 to 0.75 higher than the mean level of the Atlantic, but this is probably owing only to local circumstances, and it may be assumed that there is no difference in the mean levels of the two oceans.

The conclusions arrived at by the successive independent surveys carried out at the expense of Mr. Kelley, may be summed up as follows:—

*First*—That the oceans can be united through the Atrato and Truando by a canal without a lock or any other impediment.

*Second*—That while the distance between the oceans by this route is only 131 m., half that distance is provided by nature, with a passage for the largest ships.

*Third*—The remaining distance requires the removal of bars, excavations, and cuttings, presenting no unusual difficulties.

*Fourth*—Harbours requiring but little improvement to render them excellent, exist at the termini.

These investigations have been carried thus far at the expense and through the untiring perseverance of private enterprise.

The capabilities which have been brought to light appear to be of a nature to warrant a special inquiry, of an authorized and international character, both in the direction pointed out by these successive and independent surveys, and wherever the nature of the coast would justify an examination of the interior.

To this point the attention of the great maritime governments of Great Britain, France, and the United States is now being directed, and it is hoped that the proposal to extend and certify the geographical knowledge of the narrow strip of land which divides the two great oceans, by means of governmental investigation, will be considered deserving of the support of the Royal Geographical Society.

XV. — *On Steam Communication with the Southern Colonies (Australia and the Cape of Good Hope).* By Captain J. LORT STOKES, R.N., F.R.G.S.

*Read, May 12, 1856.*

DURING the past ten years the establishment of steam communication with Australia has undergone the most ample discussion and inquiry, both at home and in the colonies. The period has now arrived when it is absolutely necessary that our southern colonies should be knit together, and to the mother country, by that great artery of commerce, steam. Various routes, proposed by private enterprise and local interests, have been suggested, but seem to be inconsistent with the general interests of the Australian settlements, and unsupported by the evidence that had been accumulated.

Upon reference to the investigations that have been recorded on this subject, the following concurrent evidence will be found in favour of a route which appears to have been comparatively neglected :—

In 1846 a select committee of the Legislative Council of New South Wales, after obtaining a mass of evidence, reported, that “the least expensive, the most expeditious, and the most convenient and advantageous plan would be to join the China line at Singapore by Torres Strait.” . . . . . “The advantages,” says the Report, “derivable to Australia from connexion with our Indian possessions and other parts of the East, would be greater even, than any direct advantage from postal communication with the mother country.”

Again, in 1846, Admiral Sir Francis Beaufort, then Admiralty Hydrographer, recommended the eastern route by Singapore and Torres Strait, objecting to the western route through the Indian Ocean, on account of its adverse winds and other obstacles and disadvantages. Sir Francis Beaufort’s report was printed in the Parliamentary papers, and no higher authority can be quoted.

Previously to the publication of these concurrent recommendations, I had urged a route through Torres Strait at meetings which took place in the City in 1845, and also in my publication of ‘Discoveries in Australia,’ made while surveying the coasts of that continent, between 1837 and 1843.

The chief objection against the Torres Strait route has only been raised in a cursory manner, on the ground of the dangerous navigation of the Strait, and the presumed boisterous and thick weather experienced there during the western monsoon. In reply to the latter it may be remembered that H.M.S. ‘Fly,’ Captain Blackwood, entered the Strait during the western monsoon, making the land



without difficulty. Thanks to the Admiralty surveys of Captains Blackwood and Owen Stanley, other objections to Torres Strait may be readily obviated; and it will not be supposed that the Admiralty Hydrographer, in recommending that route, overlooked the nature of the passage; while it may be fairly concluded that he was prepared to counteract its remediable defects.

As rather an exaggerated notion of the dangers of this part of the route appears to be entertained, the following details of the passage which I recommend, may be acceptable.

Ships coming from the westward should arrange to make Booby Island (in lat.  $10^{\circ} 36' \text{ s.}$ , and long.  $141^{\circ} 56' \text{ e.}$ ) before daylight; and through the tranquil seas of the Asiatic archipelago, steamers may reckon on doing so with some certainty. To facilitate the approach to Booby Island by night, it is proposed to erect a light house, although from its elevation, isolated position, and bold character, there is no difficulty in making it at any time. Hence the track proceeds through Prince of Wales Channel, the entrance to which is a mile in width, having a sunk reef on its northern side, which it is proposed to mark plainly by two buoys. In every other part of the track the passage is much wider, varying from 3 miles, in only a very few places, to 10 and 20 miles generally, and free from hidden dangers, except in the single case of the western entrance.

On clearing Prince of Wales Channel, the course lies northeasterly, between Travers Island and Double Island (7 m. apart), in the direction of Mount Ernest, which is above 750 ft. high. Thence it takes a more easterly course, passing midway between Saddle Island and Ninepin Rock, where the channel narrows to  $3\frac{1}{2}$  m., at a distance of 40 m. from the western entrance. The track continues nearly in the same direction, passing close to the s. side of Bet Island, and midway between Dove Island, Coconut Island, and Village Island. Then it passes w. of Arden Island and Rennell Island, between Dalrymple and Campbell. Six m. s.e. of the lastnamed, lies Stevens Island, at a distance of about 100 m. from Prince of Wales Channel. From abreast of this island, daylight is no longer necessary, the passage lying through Bligh Entrance, between Bramble Cay and the tidal reef S. of it, leaving a width of 13 m., and a depth of 22 to 26 fathoms. It is proposed (if thought desirable) to mark this entrance by a light on Bramble Cay, and a buoy near the tidal reef. The track continues eastward, passing outside Portlock reef and the Eastern Fields, when the sea is open in the direction of Sydney. The islets, which dot this part of the Strait, are so bold that they of themselves, quite beacon the passage. Sail may be carried through the greater part of it in either monsoon.

In making the eastern entrance of Torres Strait the lofty moun-

tains of New Guinea may be seen forming a safe landfall; and the greatest comfort to the navigator, is the singular shelving nature of the bottom, fronting Bligh Entrance.

Throughout the Strait, the direction of the track ranges only between E. and N.E., or W. and S.W., without any sharp turn. The streams of tide set fair along it, with a moderate and even depth of water throughout, and the navigation is the easiest that it is possible to imagine through a coral sea. For a hundred miles only is daylight at all necessary.

As it will be requisite to have a coal depôt in Torres Strait, the party in charge might superintend the lights, buoys, and also the pilotage that may become desirable. The coal may be conveyed from the mines near Sydney to this depôt, with a degree of ease and economy that can never be attained on the southern route; this is owing to the number of ships which proceed from Sydney in ballast through Torres Strait to India.

The advantages of the Torres Strait route in developing the commerce of Australia, have been alluded to in quoting the Report of the New South Wales Legislature. The commerce of the mother country must also be largely promoted by steam communication along that part of the track passing through the Asiatic Archipelago, teeming with population, and abounding in natural products of the greatest value. There is at present no British entrepôt in those seas eastward of Singapore, although the Arru Islands alone, at a distance of 2000 m. from Singapore, were reported some years since to consume British goods of the annual value of 30,500/.

The Torres Strait route recommends itself under another important aspect. The only part of Australia where new settlements can be formed, must be sought northward of Sydney, along the eastern coast, and in the Gulf of Carpentaria. Among other prosperous localities on the E. coast, Moreton Bay has already become an important centre, and flocks and herds are rapidly stretching northward along the salubrious lofty downs and perennial rivers of the coast ranges. About 2,000,000 of sheep, 234,000 cattle, and more than 8000 horses are already enumerated in these districts. The squatters had reached Peak Range some time since; and the period cannot be distant when they will seek an outlet in the Gulf of Carpentaria, as they formerly did at Port Phillip. Sir Thomas Mitchell has described the country stretching away from the Barcú River towards the Gulf of Carpentaria, as the finest in Australia. Leichhardt, on his overland journey from Sydney to Port Essington, along the southern shores of the Gulf, says, that "cattle driven by easy stages would fatten on the road;" and he describes the climate as highly congenial to the human constitution, even under adverse circumstances. My



own explorations in the interior, confirm the experience of this eminent traveller.

The formation of a settlement on the southern shores of the Gulf of Carpentaria, adjacent to the harbour discovered by Flinders and surveyed by myself, would operate at once as a trading depôt for the eastern end of the Archipelago, distant 2000 m. from Singapore; and it would also provide an outlet and port for the squatters, moving towards that direction.

At a distance of 1500 m. from Sydney, such a settlement would offer very favourable conditions for a penal establishment, the territory, though wholly unoccupied, being extensive, fertile, and capable of sustaining a large population. Road-making and other public works would afford the convicts abundant occupation without resorting to the objectionable practice of placing them in private families—a system which caused as much mischief in the colonies, as tickets-of-leave are producing now at home. A system of dispersion may certainly be adopted that would be of equal advantage to the settlement and the convict.

I recommended this proposal to the Duke of Newcastle, when he did me the honour to consult me about the North Australian Exploring Expedition. At that time the ticket-of-leave system had not reached its climax; while the recent meeting of convicts, convened by Mr. Mayhew, has, by the evidence of convicts themselves, placed a seal on the inefficacy of any plan short of migration. The state of our prisons also renders it evident that an outlet of this kind is required.

Western Australia almost owes its maintenance to the transfer of convicts to that isolated settlement; but its capacity for their profitable occupation must soon reach its limit, owing to the restrictive extent of its productive resources. After the boundary of North Australia was settled on the map, it was the intention of the Government to establish a remodelled penal settlement there. The Moreton Bay settlers have themselves expressed a wish for convict labour.

To return, however, to points bearing more immediately on steam communication with Australia, it would seem that those who have advocated a southerly route across the Indian Ocean from Aden by Diego Garcia, though only some hundred miles shorter than that by Singapore and Torres Strait, have overlooked the circumstance, that it crosses a hurricane track, and is exposed to the high seas and strong winds so frequent on the S. coast of Australia. Against these impediments it will be found that no steamer can depend on keeping her time, and the home mail-ship from India will be frequently missed at Aden. This delay of the Australian return mail would be far less likely to occur, on the more tranquil or smooth sea route to Singapore by Torres Strait, which has also

the advantage of large population and active trade along its shores.

Another advantage in the Torres Strait route, is the adoption of Sydney, the seat of the Governor-General, as the Australian terminus. As a harbour, and with its facilities for repairing large ships, it is infinitely superior to Melbourne. To this must be added its proximity to New Zealand, to the growing trade of Polynesia, and to the great and available coal-fields in its immediate neighbourhood.

These subjects all deserve some further consideration than a passing allusion; but I will only dwell for a few moments on the additional importance, which Eastern Australia derives from the progress of other European interests in Polynesia, and more especially in New Caledonia, fronting our seaboard.

The occupation by the French of this fine island, discovered by our immortal Captain Cook, must have a great influence on our Australian interests, and not less on our relations with the adjacent regions in the Asiatic Archipelago and in the Pacific. At first doubtless, New Caledonia will derive supplies of cattle, coal, &c., from our adjacent settlements on the eastern coast of Australia, and the demand thereby created, will tend to hasten the progress of settlement along that coast. But as New Caledonia possesses coal mines, and boasts of fresher and richer pastures than Australia, and even anticipates the production of finer wool than our own, that island, supported in her infancy by the resources of France, will doubtless soon be changed from the condition of a customer to that of a competitor. Already we have heard of the attractions which New Caledonia will offer to vessels trading between Australia and China; and it is therefore only consistent with prudence and foresight, to strengthen the traffic which has been established between Australia and the Asiatic continent and Archipelago, by introducing steam communication on that route, and encouraging the extension of settlement towards the great northern Gulf of Carpentaria.

From the vast amount of local steam communication existing in Australasia, it may be considered that branch lines are already established from Sydney to Melbourne, South Australia, Tasmania, and New Zealand. The Swan River mail might be conveyed by a smart schooner from South Australia.

If the outward mail should be a day or two longer in reaching Melbourne by the Torres Strait route, that risk will be amply compensated by preventing the home mail from being delayed a fortnight at Aden, an inconvenience which has occurred on the southern route.

If the Australian subsidy be great enough to warrant two lines, then a second from Aden, *viâ* the Mauritius, King George Sound,



and Adelaide to Melbourne may be adopted, leaving New Zealand, Sydney, and Moreton Bay to join the Indian trunk line at Singapore, *via* Torres Strait. The rough and stormy sea passage from the Mauritius would probably at first give greater satisfaction to the south coast settlements, and may cause an earlier delivery of the outward mail to those places; but for regularity, economy, and speed, particularly homeward, the Torres Strait route would, I believe, ultimately be preferred. As to the comparative comfort of the two lines there can be no question; on the one there will be a continual roll, with nothing but sea! sea! sea!—while the other offers placid waters and picturesque scenery through its greater part.

It may be observed that many thousand tons of sugar, consumed by Australia, are supplied in almost equal quantities, by Mauritius and the Asiatic archipelago.

The consideration of steam traffic with our great settlements on the eastern side of the Indian Ocean, naturally gives rise to reflections on our communications with the great African continent which forms the western boundary of that ocean.

A branch from the great trunk line to India may be established, offering better prospects of profit and greater facilities of postal communication to the Cape of Good Hope, than it has ever enjoyed.

This line, starting from Aden, might touch at Mauritius and Bourbon, or, proceeding along the African coast, it may derive support from the trading ports of Zanzibar, Mombas, the Portuguese settlements of Mozambique, Joanna in the Comoro Islands, the great island of Madagascar, Delagoa Bay, Natal, Algoa Bay, and the Cape of Good Hope. Eastern and southern Africa and the wealthy islands of the Indian Ocean would thus be brought into connexion with the advantages of the overland railway transit.

Whenever it shall be determined to unite the Cape of Good Hope and Australia with England by the electric wire, these lines will also be found to be the most practicable. Already the East India Company are about to extend their cables to Sumatra and Java.

The effect of postal facilities in developing trade along populous and naturally productive routes must lead to results of great importance. The lines proposed are of this character. No great, profitless stretches of ocean and uninhabited coast, so ruinous to steamship owners, would have to be passed. On the contrary, population would be followed on the track which it has marked out; and the proposed routes would develop intermediate traffic, as well as form the grand trunk lines of communication from the centre of government and commerce, to these extremities of the British dominions.





Appearance of Long Island, when on the S.W. side of it as seen from the Chart. The island was distant two miles.

C. Birds of Columbus





XVI.—*The Landfall of Columbus on his first Voyage to America.*  
By Capt. A. B. BECHER, R.N., F.R.A., and R.G.S.

*Read, June 23, 1856.*

THE land discovered by Columbus at the end of his first voyage across the Atlantic, on the 12th of October, 1492, or, as termed by seamen, his landfall, must ever be a point of interest in the history of America, and therefore an account of that discovery founded on his own statement, may not be considered unworthy of preservation among even the discoveries of modern days, which are the more legitimate objects of the Royal Geographical Society. With this view the following statement is offered for its acceptance.

It is well known that two islands about 300 m. apart from each other, one named the Grand Turk and the other Cat Island, are held by different authorities to be the San Salvador of Columbus, the name of that little island ("isleta" he terms it in alluding to it about three months after he discovered it), on which this great Admiral first set his foot on American ground. The former is the adoption of Señor Navarrete when he was the chief of the Hydrographic Office at Madrid, and the latter that of Washington Irving, in his *Life of the Admiral*, published in 1823. Turk's Island in certain respects answers the description of San Salvador as given by Columbus, excepting that there was not so much water as would justify the expression of Columbus, when he states that he found there "muchas aguas," or water in abundance. But there are other conditions which entirely set aside all possibility of Columbus ever having seen Turk's Island, that will become evident in the sequel of this paper, and will prove that Señor Navarrete was wholly mistaken when he came to that conclusion, and that, although he himself had printed the very words of Columbus by which his mistake will be shown, he had not the good fortune to perceive it.

No less mistaken, though nearer to the actual island on which Columbus landed, was Washington Irving, in his conclusion that Cat Island first received the great Admiral at the end of his voyage, and this gentleman's view of the subject has been strenuously supported by Baron Humboldt, in his elaborate work entitled "*A Critical Inquiry into the History of America.*" Cat Island had long been supposed by geographers to be the San Salvador of Columbus, and seems only to have been renewed in that character by Washington Irving in his *Life of the Admiral*. But it is also very well known that there are certain features about Cat Island, that do not coincide with the description of San Salvador by Columbus, and that it is totally inadmissible as his landfall, though it has long been so called. There were in fact objections to both of these islands being San Salvador, but of a different kind; and



thus the question was found by me in 1847, and I only succeeded in discovering the real track of Columbus after several years of close investigation. It was then I found that neither of them was the landfall of Columbus.

The means of doing so, however, had been supplied by Señor Navarrete, who with a praiseworthy zeal had printed the original papers of Columbus, or what remained of them, in his valuable work extending to five volumes, of the voyages of the early Spanish navigators, the first of which contains those few descriptive passages which have enabled me to trace his progress from his landfall to Cuba.

The island on which Columbus first landed and the several discoveries which he made in his progress to Cuba, are proved by his own words, not only in their description but in the courses which he says that he followed and the distances which he sailed upon them in going from one to another. These so entirely agree with the chart, that no room is left for doubt as to his position at any time among them.

It may be scarcely necessary to premise here, that no attention whatever has been paid to the track of the Admiral across the ocean, in determining which was the island named by him "San Salvador." This would evidently involve so many sources of error in the shape of currents and variation, &c., that, as Navarrete has shown, almost any island might be made his landfall that he could approach from the S.E.

The ships were steering a W.S.W. course as they had been all the preceding day, to which course about a point and a half of westerly variation being allowed, would make them approach the island on a S.W.  $\frac{1}{2}$  W. course; when about 10 at night of the 11th October, 1492, the Admiral discovered a light, and calling to him Pedro Gutierrez, pointed it out to him, when he saw it also. But another officer, Rodrigo Sanchez, to whom it was pointed out, could not see it. What direction the light was seen in is not said, but, as the ships were running at the rate of about five or six knots, and land was distinctly seen at two in the morning of the 12th, when they were brought to the wind, they would have run a farther distance of about 20 m. from where it was first seen. Now as the principal hill of Watling Island is about 140 ft. high, it is not impossible that this light might have been that of a fire on its summit just then on the horizon of the ships, or it might have been that of a meteor commonly known by seamen. Nothing more, however, is said of it, and at 2 A.M. on the 12th, the land was so distinct that the ships laid by for daylight, when an island clothed with verdure delighted the eyes of Columbus and his crews, and dispelled the gloom approaching to despair, which had prevailed among them for several days.

The description given by Columbus of this island, which the natives called "Guanahani," is brief, but sufficiently remarkable to recognise it as Watling Island. He says—"It is a tolerably large island, with fine trees and a large lake in the middle of it; it has no mountains, and is covered with verdure, which is pleasing to the eye."\*

In respect of the general character of the island, here is a complete statement of that of Watling Island. It is well known to be eaten out, as Captain R. Owen states it, by a lake; the highest part is not more than 140 feet above the sea; the rest is comparatively low ground; it abounds in verdure, and is, in fact, known in these days among the colonists as the garden of the Bahamas. It is rather remarkable that Columbus should have fallen on this island at the end of his voyage, and that it should have been found by him in the same cultivated condition as it appears to have continued. For his description has encouraged the historian of his voyage to draw too flattering a picture of the condition in which a new world was found by Columbus. Every one remembers the vivid description of Washington Irving—"the ample forests and the fruits of tempting hue, but unknown kind," growing among the trees which "overhung the shores of a level, beautiful island several leagues in extent, of great freshness of verdure, covered with trees like an orchard" (vol. i. p. 228).

Columbus found the island in a highly cultivated condition, and is in some degree responsible for the glowing terms in which it is here described, when he completes his own simple picture of it with the assertion, that "it is pleasing to the eye;" for he left the world under the impression that the large lake from which rippling streams fell into the sea was composed of *fresh* water, whereas it is known to be *salt*, and unfit for use; and this accounts for his not watering his ships there—for his not replenishing them with an article of which, after their long voyage across the ocean, they must have been much in need, for water was the first object of which he went in search as he proceeded onward among the islands.

The native name of this island was Guanahani; and Columbus bestowed on it the title of San Salvador, in gratitude for the success of his voyage. But this name, by common consent, has long been applied to Cat Island, as above mentioned, a large island to the n.w. of Watling Island, notwithstanding the want of agreement in its size and general character with the description given of it by Columbus. This difference of character was so evident to Señor Navarrete that he devoted great pains to ascertain what

\* "Esta isla es bien grande, y muy llana, y de arboles muy verde, y muchas aguas, y una laguna en medio, muy grande, sin ninguna montaña, y toda ella verde, ques placer de mirarla."—*Nac.*, vol. i. p. 23.



island would correspond with that description. And notwithstanding it was the opinion of a Spanish officer named Muñoz, that Watling Island fully answered to it, the opinions of Señor Muñoz as well as Navarrete, that Columbus was perpetually sailing w., induced the latter to consider the principal island of the Turk Island group as the landfall; and accordingly Navarrete has contrived to lay down a track for the Admiral which takes him past the Caicos and Inagua. This view of the landfall has been supported by Mr. Arthur Gibbs, a resident on the Grand Turk, who has read a paper on the subject before the Literary Society of New York, which has been published in the Transactions of that body.

Among the objections to Cat Island being the Guanahani of Columbus, is the circumstance of the Admiral having gone in his boat from his anchorage on the N.E. side of the island, round the northern end of it, on Sunday morning after sunrise, followed by his ship, and returning to her in the afternoon; a proceeding which it would have been impossible to have accomplished at Cat Island. The size of Cat Island, as well as the want of a channel to the westward of it, precludes the possibility of this being done, and shows at once that Cat Island could not have been the Guanahani of Columbus, independently of those peculiar features of his landfall that are mentioned by him.

Señor Navarrete, in printing the papers of Columbus, says nothing of the anchorage of his ships. But there can be no doubt that between the morning of Friday the 12th and Sunday the 14th of October, 1492, to prevent being drifted away while communication with the shore was going forward, they must have found an anchorage. The plan of the island of Mr. de Mayne, drawn by Captain Barnett, when a midshipman serving with him, shows that the bank on which it stands affords ample room for anchorage on the E. side of the island in about 7 fathoms water; and the nature of the weather might have allowed Columbus to avail himself of it at the time he arrived, for the general character of the weather he seems to have had, was mostly light variable winds and calms; and he says in one part of his journal, that no day since he had been among the islands had passed without rain. From the eastern side of the island, however, Columbus specially states, that he went round it by a N.N.E. course ("Por el camino Nor Nordest"), leaving no doubt on that subject whatever; and it is concluded that the ships followed, as he uses the expression, "*Me movi este mañana*," in addition to his allusion to the boat expedition. From these premises it is inferred, as he expresses his intention of going to the s.w., that the Admiral, after having explored the western side of the island, returned on board on the w. side, and proceeded on his discovery to the s.w. for the

largest island he had seen from Guanahani. He says in his journal that he had seen so many that he did not know which to visit first; but he also adds that the natives enumerated above a hundred. Probably these two statements were confused with each other in his mind, and he was referring to the latter when he said simply that he should go to the largest in sight.

Now as Columbus not only expressed the intention of going to the s.w., but is actually steering that course while he is writing, when he says, "and so I am doing"—*y asi hago*—(*Nar.*, p. 25); and as Rum Cay, being nearest to Watling Island, would be the first that would arrest his attention, on the above authority it is concluded that this island was the *next* which Columbus steered for on leaving Watling Island, as it lies in the direction mentioned by him to the "south-west." Thus he says, on Saturday the 13th of October: "Determiné de aguardar fasta mañana en la tarde, y despues partir para el Sudueste" (*Nar.*, p. 28).

It is somewhat difficult to imagine how Cat Island could be upheld as the San Salvador of Columbus, when it is considered how totally opposite the general character of it is from Watling Island, the features of which in every particular agree with those mentioned by Columbus. Instead of the large lake corresponding to the "*muchas aguas*" mentioned by the Admiral, Cat Island has for the most part *high land*. But as the boat expedition could not have found its way round it as easily as round Watling Island in the course of a morning, with these objections against Cat Island being the San Salvador of Columbus, it may be safely left to the evidence which will subsequently appear to establish Watling Island as being the true landfall.

In the afternoon of Sunday, the 14th of October, Columbus pursued his course to the s.w. for the next island, having, it appears, afterwards embarked several of the natives of Guanahani, with the view of obtaining information from them as he proceeded. He considers the next island to be about 5 leagues from him, but afterwards says it is rather *seven*. He is becalmed in the course of the night of Sunday, and complains of the current detaining him (well known to seamen in that part), so that with that and the calm which prevailed, he did not reach the island until noon of the next day, Monday; finding a rocky shore, besides no considerable island after all, he is determined to persevere in his westerly course by seeing another very large island to the westward, and accordingly he crowds all the sail he can and reaches the cape of this second island, so as to anchor off it about sunset. This is expressed by Columbus in the following words:—"Y como desta isla vide otra mayor al oueste, cargué las velas. . . . Y cuasi al poner del Sol surgi acerca del dicho cabo," (p. 26, *Nanarrete*). The cape at which he had arrived was the s.w.



extreme of Long Island, and the island which he had thus passed appears in the chart as Rum Cay.\* The Admiral says that the face of the island next to San Salvador lies n. and s. about 5 leagues, and that which lies e. and w., which he followed, is more than 10 leagues in extent. These measurements are decidedly exaggerated, but some allowance must be made for the Admiral in this outset of his success. He was now proving the truth of his theory. Every step in his progress was adding to his success, and he was now realizing those discoveries which were to immortalize his name. The n.w. end of Long Island, off which Columbus had anchored, was named by him Cape Santa Maria de la Concepcion, and he makes reference to the island he had passed, by observing in his journal, that notwithstanding it was his desire not to pass any without taking possession, yet in doing so to one he considered it applied to all.†

However, in landing at Cape Santa Maria, the n.w. end of Long Island, he is received by a few unclothed natives, who have no intention of resisting him. On the contrary, they are delighted to see him, and offer him anything in the island; but he soon finds nothing to detain him—he is on the extreme end of a very narrow island—and speedily makes up his mind to continue his course to the westward to another island which he sees, and applies to it the name of Fernandina. But he is desirous of going to the s.w., as the natives he has on board, point that way as well as to the s., as the direction in which there is a large island. However, the wind, which is light, draws to the southward, and he is content to stand to the westward for Fernandina, which he says is 9 leagues farther. On his way to it he takes up a canoe with an Indian, and finds that he had come from Guanahani, but afterwards lets him go with presents of beads, that he may produce a good effect among his countrymen. On Wednesday morning, the 17th of October, he anchors off a settlement on the island he had named Fernandina, and at 9 sends his boat on shore for water, when the Indian is found whom he had taken on board with his canoe on the way; and the Admiral remarks here on the good effect his presents had produced, for the natives had received so favourable a report, that they assisted the boat's crew in filling the casks and carrying them to the boat.‡ We have here the first indication of scarcity of water at Guanahani. Had the large lake and the streams running from it been

\* His words are, "Y como la isla fuese mas lejos de cinco leguas, antes sería siete, y la mar me detuvo, sería medio día cuando llegué a la dicha isla."—*Navegante*, p. 25.

† His words are, "Con todo, mi voluntad era de no pasar por ninguna isla de que no tomase posesion, puesto que tomado de una se puede decir de todas."

‡ "Y ellos mismos traian los barriles llenos al batel."—*Nor.*, p. 29.

pure fresh water, the Admiral would gladly have watered his ships, for we find him looking for it and glad to get it from the natives, of whom he had been inquiring for it as soon as he landed.

The Admiral was still desirous of going to the s.w. or southward, because he had ascertained from the natives that in the former direction there certainly lay a very large city, in which he had been led to the belief, from reading the travels of Marco Polo, that the Emperor of Japan was to be found, and he firmly believed that the islands which he had now discovered were the outskirts of his country; nor was this impression ever removed from his mind by all the experience obtained in his subsequent voyages. This opinion had been encouraged by a chart which he had received from the great geographer of the day, Toscanelli. While the Admiral was offering his services to the Portuguese government, with the assistance of Toscanelli's chart, he had come to the conclusion that if he sailed a certain distance to the w. he must arrive there, but that distance was very far short of the real distance he would have had to sail w. to have reached it, could he have done so. He had observed to the Spanish conference at Salamanca, that, whatever land formed the western boundary of the ocean, he would discover it; and here he was right. But his imagination had become so entirely occupied by the Japanese Emperor and his large city, for whom he had been supplied with letters from Ferdinand and Isabella, that no other land than that of their dominions seems ever to have entered his mind. When he reached Cuba, and considered from the increasing population which he met with, and the extent of coast he had passed along, that he must either be close to his city or to some considerable city of the Emperor's dominions, he then sent off his messengers, one of whom had embarked in the voyage on account of his knowledge of Eastern languages, to deliver these despatches. Such was the infatuation of Columbus on this subject of his heart, that he could receive no accounts of any kind from the natives but which he construed into the meaning that he was on the coast of Japan, and the word *Cipango*, which they mentioned occasionally, was caught at with avidity by him as meaning Japan. On the subject of Japan, the figure of the earth, and that of a terrestrial paradise, his ideas were of the most extraordinary and romantic description.

To return, however, to his anchorage off Exuma,—and which appears most probably to have been abreast of Exuma Harbour, as it seems to have been the principal settlement off which he had anchored,—his great desire was to go to the southward, but the wind, which on the previous day had been s.e., was now from the southward and drawing to the s.w. dead against him. The



island of Exuma lies in a N.W. and S.E. direction, and would appear by a ridge of cays, which continues from its S.E. end towards Long Island, to connect the two islands, as this ridge sweeps round in an easterly direction towards the cape, off which Columbus had anchored and named Cape Santa Maria; thus leading him to suppose that he had crossed a deep bay. However this may be, it will appear in the sequel that Columbus considered this island of Exuma, which he had named Fernandina, and off which he had anchored, to be connected with that of which Cape Santa Maria was formed.

It was at this anchorage off Exuma that Martin Pinzon, the Commander of the 'Pinta,' knowing the Admiral's wishes, came to him and proposed to continue their course along the island to the N.W., as he had understood from an Indian he had on board that they would be able to go to the S.W., on the western side of it, as soon as they could pass round the N.W. end of it. Accordingly this proposal was adopted by Columbus, and the ships all made sail to the N.W. They had not gone very far, and were about two leagues from the Cape of the Island, when the Admiral was induced to drop his anchor, from seeing what appeared to be the mouth of a large river, and, considering it a good opportunity to obtain water, the boats of the three vessels took their water-casks and proceeded to enter it. Great was their disappointment when, instead of a river, they found a wide-spreading shallow piece of water, which Columbus is careful to describe as having two entrances, or rather one with an island in it, and a harbour which would hold all the ships of Christendom, if it had but depth of water! But it was all shallow, as the shores of Exuma appear to be by the surveys of Captain Barnett, being a low shelving shore, so slightly inclined as to be covered with two or three feet of water only for several miles.\*

Leaving this anchorage, the ships still stood on to the N.W., and, having reached the part of the island which the Admiral says runs E. and W.—by which he must have meant the first opening between it and the Cays to the N.W.—the wind, which had been S.W., had headed them and become N.W., from whence it freshened, and, as Columbus observes, it was fair for where they had come from. Thus he was disappointed in his object, and as the evening was near, with the promise of a bad night, the Admiral bore up and stood to the E. and S.E., as he says, to keep off the

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\* That there may be no misconception of the facts here stated, it may be as well to quote the words of the Admiral. He says,—“Dí la vela al Nor-norueste, y cuando fue acerca del cabo de la isla, á dos leguas, hallé un muy maravilloso puerto con una boca, aunque dos bocas se le puede decir, porque tiene un isleo en medio . . . y así surgi fuera dél, y fué en él con todas las harcas de los navios.”—*Nar.*, p. 31.

land, "para apartarme de la tierra" (p. 32), and he experienced what he seemed to have expected and what seamen would perhaps call heavy weather, very different from the light winds he had previously sailed with, although, as he observes, he had not passed a day without rain since he had been among the islands. But it is the kind of weather to be found among the Bahamas at the time of year in which Columbus made his discoveries, or the time of the autumnal rains.

This is, perhaps, one of the most interesting points in the progress of the Admiral between his Landfall and Cuba. The courses which he adopts from thence to s.w. and w. and s.w., when referred to the chart, are completely corroborated by the positions of the islands, and having arrived thus far, when he is overtaken by night and bad weather, and having seen sufficient of the navigation to the southward of him, he very wisely stands out to the eastward, as he says, "to keep off the land."

The same weather, it would appear, continued all the next day, Thursday, the 18th of October, in which he was running along the shore of Long Island in the intervals, when he could see the land, and lying by in the squalls; but on Thursday evening, after sailing round the s.e. end of the island, as far as the state of the wind and daylight permitted, the three ships came to an anchor under it for the night. The passage in which this is related is brief and concise, just such as might be expected from the severe weather it refers to. He says of it in his journal, "and rain fell from midnight till nearly daylight, and we at the s.e. part of the island, where I hope to anchor till it clears up, that we may find the other islands to which we have to go." The next which follows would seem to be added afterwards; but there appears no break, as it is printed by Navarrete. He adds: "As soon as it cleared up we made sail, and went round the island as far as we could, and then anchored but did not land." \* This place of anchoring is marked in the chart, and, as will appear in the sequel, was under Cape Verde, the s.w. point of Long Island.

On the following morning, with a fair northerly breeze, the three vessels sallied forth from their anchorage under the Cape, resolved on discovering an island, which Columbus had made out from the Indians he had taken away from Guanahani, lay in an easterly direction, and the Admiral is very particular in stating the several courses which he had directed each ship to adopt. Thus the 'Nina' steered e.s.e., the 'Pinta' s.s.e., and the 'Santa Maria'—his own ship—steered s.e. between them, each having orders to keep their several courses, but to rejoin him at noon; a measure

\* "Despues que aclarasció seguí el viento, y fué en derredor de la isla quanto pude y surgi . . . mas no fuí en tierra."—*Nac.*, p. 33.



which was well calculated to effect the object in view, and which the wind, being north, would readily admit. They had not sailed long, however, on these courses before land was observed, and by noon all the ships had taken up an anchorage off Cabo del Isleo. It is fortunate that the Admiral has been particular, not only in specifying these courses, but also in describing the bare rocky islet, which he very properly calls "el isleo," referring to the shoal water, not only to the northward of the islet, but also between it and the north shore of the island, which island is called by the Indians "Saomete," and is named by him "Isabella." It is, in fact, thus distinguished at once as the principal of the Crooked Island group.

The anxiety evinced by the Admiral in the determined manner in which the ships set about discovering these islands, is readily accounted for by the abundance of gold which he supposed it to contain, as well as he could make out from the natives. Their information, however, was little to be depended on, for it was obtained from them by means of signs. This mode of communication afterwards misled Columbus so much, that in the course of his passage along the coast of Haiti, he alludes to the little progress that had been made in understanding them, and observes that they appear to communicate intelligence with a view to deceive him. The want of a knowledge of their language was perpetually occasioning disappointment to the Admiral, but in no respect more than that of gold, which was the principal object of his inquiry. In this island of Isabella, where he now was, he had been led to believe that a king resided, who had in his possession so large quantities of it, that even his clothes were ornamented with it, and thence great were his expectations of enriching himself. From this constant misconception also of the real meaning of what the Indians reported, arose the statement, which appears in his letter to the sovereigns of Spain, of a race of people in Cuba who were born with tails, like animals, and another with the snouts of dogs and one-eyed monsters. These extraordinary notions, along with that of the figure of the earth and the terrestrial paradise, already alluded to, were among the marvels of that superstition which was rife in the world in the days of Columbus. He had nobly cleared away, by his voyage across the ocean, the ancient notion of the sea being unnavigable, from its slimy and muddy nature—an idea which almost seems to have been inherited by man from the deluge, because he desired to establish the truth of his theory of a western land. But having found this land, he persevered in maintaining that it was Japan he had found, against all reason, and quoted lengthy passages from Scripture to prove that the figure of the earth was that of a pear, and that the end of the elongated part of it was the seat of the terrestrial paradise, and hence, from its situation, it must necessarily be the most elevated and the nearest to the Heavens.

The Admiral, being under the impression that the island he had left in the morning was Fernandina, gave the name of Isabella to the principal of the group of the Crooked Islands; and whatever might have been his reason, whether out of respect for his patroness, or whether such really was the case, he finds so much delicious perfume proceeding from these islands, that he is lavish in his praises of them. Old seamen, it is well known, are notorious for being able to smell the land at a great distance, but certainly never had an Admiral experienced the delicious odours of sweet flowers more powerfully than those wafted by the breezes from the island of Isabella—the fragrance of a thousand different kinds of trees, and all with fruit and delicious perfume; and, he adds, “the very air was loaded with the delicious scent of beautiful flowers.” The native name of Crooked Island, ‘Saometo,’ or ‘Saometo,’ was exchanged for Isabella, either on account of all this fragrance, or, having named it Isabella, Columbus found its fragrance afterwards; but in deference to the Admiral, and out of respect for a great man who benefited mankind by extending the boundaries of the known world, I have ventured to propose that the few names given by Columbus to these long-lost islands of his earliest discovery in the New World be preserved, and that the name of the Fragrant Isles be substituted for that of the Crooked Islands, as a gracious recognition of those feelings of respect for his patroness Isabella, to whose patronage the voyage was mainly due. In respect to Long Island, the s.w. end of which he had just left, he was under the impression that it formed part of Exuma, which he had named Fernandina. He had seen that Exuma lay in the direction of s.w. and s.e., and might have considered it as continuing in the latter direction, by seeing the range of Cays trending towards the western shore of Long Island, the N. end of which he had named Cape Santa Maria de la Concepcion; and, in running along the eastern shore of Long Island in a night and a day of bad weather, the deception was continued in his mind. In order, therefore, to preserve his names as much as possible, it is here proposed to retain Cape Santa Maria, and give the name of Concepcion to Long Island, and to leave Exuma as Fernandina, being all names actually bestowed by Columbus. The little island which he passed to the northward, called “Rum Cay,” without alluding to it, and which has obtained the name of Concepcion, it is here proposed to call “False Concepcion,” as not being entitled to any notice from Columbus. And thus, Watling Island being the San Salvador, all the names bestowed by the Admiral will be always recognized on the maps; Cat Island being made to restore that high title of which it has deprived its less pretending neighbour Watling Island, and remaining as it is, Cat Island.

High as the expectations of the Admiral had been, they were



gradually dissipated. He attempted to approach the inner shores of the Fragrant group, with the view of visiting the king, by sailing over the large space of water which they inclose; but he found it, as it still is, too shoal even for the small ships of his day. He soon discovers that he has seen all he can: the trees, the shrubs, and the flowers, and the large lakes in which he mentions having killed a snake or two; and he philosophically makes up his mind, as he cannot go to the king, to await at anchor off Cape Laguna, or the Cape del Isleo, a visit from his Majesty. After waiting four days he becomes tired, and hastens his departure to look for another very large island, which he hears the natives call "Colba," and where he is told there are plenty of ships and merchants, and which, he observes in his Journal, must therefore in his opinion belong to the great Khan, the Emperor of Japan. Reverting to the subject of water for his ships, we find this still to be an object of his search, as it has been wherever he landed. Thus, he says at page 150, he is seeking good water "*andando en buscar de muy buena agua*;" and he rewards the natives for bringing it to him on board the ship; but although he alludes to the lakes both here and at Guanahani, he nowhere in his Journal says that the water of them is brackish and unfit for use.

Disappointed hitherto, but with hopes revived of finding something superior to what he has yet met with from the natives about Colba, Columbus is determined to leave his anchorage off Cape del Isleo in the evening of Wednesday, the 24th of October, but is prevented from sailing till midnight for want of wind. He is bent on going to Cuba, but of its actual distance he is quite ignorant, and therefore has prepared for a sea voyage. But he has light winds after he trips his anchor, with heavy rains, and owing to this and a current against him he makes but little way on his course of w.s.w. during the remainder of the night and all the next day, until the dusk of the evening, when he takes a seaman's departure, noting in his journal the bearing and distance of Cape Verde, the s.w. point of Fernandina, as N.W. 7 leagues; and he is careful in describing this as the westernmost part of the S. point of the island. It is this departure which proves the important fact above alluded to, that Columbus, in running along the shore of Long Island, had considered that it was connected with Fernandina.\*

In the course of the day the Admiral, who is occasionally very minute in his descriptions, accidentally names every sail of his ship, as they were all set to a gentle breeze; but soon after dark

\* The following are the words of the Admiral on this interesting point. On the evening of Wednesday, the 24th of October, he says in his Journal,—"Así anduve al camino hasta que anocheció y entonces me quedaba el Cabo Verde de la isla Fernandina, el qual es de la parte de Sur á la parte de Oeste, me quedaba al Noroeste, y hacia de mí á él siete leguas."

this breeze freshens up and the Admiral is obliged to reduce her canvas, and tells us that he did not go two leagues all night. At sunrise of the 25th of October he again makes sail, and up to 9 A.M. had run w.s.w. 5 leagues. He then alters his course to w., and up to 1 P.M. went 8 m. an hour, and so continued till 3 P.M. at the same rate, having made good 44 m. (Italian of 4 to the league), and he then sees land, consisting of seven or eight islets, extending N. and S., distant from him 5 leagues. The Admiral dropped his anchor with these islets, as he says, distant from him 5 or 6 leagues. The foregoing courses and distances, corrected for variation, and an allowance made for current, will bring the Admiral to the bank, E. of the Arenas Islets, at the distance stated by him; and from the circumstance of his having been the first European navigator who had ever dropped anchor upon it, as it stands in a compact and conspicuous manner by itself, it is proposed to name it after the Admiral "Columbus Bank," to perpetuate the memory of the man who discovered it, whose whole life was devoted to navigation, and whose name is scarcely to be found on any of his discoveries.

The 'Santa Maria' remained at her anchorage, on this bank, all the next day, the 28th of October, in the course of which Columbus visited the Arenas, most probably in the 'Pinta,' although this does not appear in his journal, for he was not one who would lay idle at anchor doing nothing. He describes the bank and the islets as being all low, and named them "*las Islas de Arena*," and alludes to the little water there was about them to the southward, as far as 6 leagues, which corresponds very well with the charts. They presented no kind of attraction for Columbus, and would most probably be very thinly inhabited, as the small population they have, even now, appears to be employed entirely in collecting salt. The Indians, whom the Admiral took on board at Guanahani, inform him that from these islands the natives reached Cuba in a day and a half, and the next morning at sunrise the ships trip their anchors and make sail on a s.s.w. course. They run 8 m. an hour until 3 P.M., which would make 40 m., and up to the evening 28 m. more on the same course, before which they saw land. Navarrete concludes the journal of this day, Saturday 27th October, by saying up to sunset they had run 17 leagues to the s.s.w. The ships lay by during a rainy night, and running down to the land on the following morning entered a beautiful harbour free from rocks or other dangers, spacious, and with ample depth of water for ships of any burthen, having an entrance large enough for them to work into, with a depth of 12 fathoms in it. There are two distinct conditions of this subject that single out the port of "Nipé" as that in which Columbus had arrived, which conditions do not apply to any other on the



north coast of Cuba. The first is the course and distance run by the Admiral from his anchorage on Columbus Bank to this port, and the other is the remarkable fact, that it is the deepest of all the harbours on the north side of Cuba, there being no other, not only with so deep an entrance, but not even with 12 fathoms in it, the depth which is specified by Columbus. These are conclusive reasons for agreeing with Señor Navarrete that the port of Nipé was that which first received the ships of Columbus in the island of Cuba.

Columbus, it is well known, was a man of an ardent disposition. He frequently expresses in his journal regret at his want of those powers of description that a knowledge of the botanical and medicinal qualities of the trees and herbs which he sees would afford him. He is lost in admiration at the scenes before him. Each one generally surpasses the former in his eyes, and he makes the observation that the islands he discovered have successively from the first increased in size, as well as resources, and that Providence reserved for the last he has discovered qualities far beyond them, and superior to anything he had ever beheld. He describes the scenery at Guanahani as pleasing to behold, and some allowance may justly be made here for eyes which had been accustomed for so many days to the monotonous and constant appearance of sea and sky. When he reaches Fernandina he is still more lavish in his praises of the bounteous hand of nature. He speaks then of branches of trees of different kinds springing from the same stem, as if grafted by the hand of man, but considers it as nature's own work, which Baron Humboldt attributes entirely to the prolific condition of tropical vegetation, these branches being so interlaced as to wear that appearance. When the Admiral is at the Fragrant Group nothing is so delicious as the odour of the flowers and herbage, and this, with the magnificence of the trees overhanging the lagoons, he says, far surpasses the powers of imagination; and here, when he arrives at the port of Nipé, his powers of description altogether fail him. He has exhausted them all. He says his descriptions have been always superlative; here they must be still more so. Everything is different from the scenery of Europe; the palms especially are of a different and finer kind, the trees generally reach to the skies; the shrubs and the flowers are superior, and the parrots and other birds are so numerous that he not only finds his welcome in the New World from their song, but the very atmosphere is darkened by them when on the wing. But Columbus had good reason, in those bright days of his success, to be pleased with all he saw. Every step he took then added to his discoveries, and the charm of novelty afforded him one continual state of enjoyment. He was the origin of all these additions to the Spanish crown; the theory he had adopted and had been







endeavouring to verify for many years of his life, although pronounced chimerical, was now tried and found correct, and he was now enjoying the triumphant answer with which he should return to his patroness Isabella. While the Portuguese were timorously extending their voyages along the African coast, thus had a little fleet of Spanish caravels boldly dashed across an unknown ocean, a sea of darkness, and found the existence of countries and people forming a Western world unknown to that in the East. The reflection that would be constantly before Columbus that he had done all this would justly entitle him to every possible consideration, and he may well be allowed to look with favourable eyes on everything in the west; to exaggerate his San Salvador with its pleasing gardens, and to leave an impression which the future historian with that warmth of feeling which the subject could scarcely fail to impart, would magnify into a large island, would convert the wild luxuriance of untamed nature into ample forests, which, in those climates, abound with extraordinary beauty of vegetation.

Thus far Columbus has not yet been understood in his geographical discoveries, which, it is hoped, the foregoing account will render clear and distinct. His subsequent proceedings have been considered by Señor Navarrete, who has laid down the tracks of his several voyages, and it is fortunate for the author of this paper that there were sufficient data in the letters of the Admiral to lay down his track from the landfall as far as Cuba, as the information which Señor Navarrete has printed, relating to any of those tracks, is quite insufficient for their verification even in the remaining part of his first voyage.

XVII—*Route between Kustenjë and the Danube by the Kara-su and Yeni-Keui Valleys, with Observations on the Navigation of the Kara-su Lakes and their Origin; also on the requirements necessary to render the Water and Land Communication practicable; being the result of an examination made during a recent journey with Lieut.-Col. Hon. A. Gordon and Lieut.-Col. J. Desaint, de l'Etat Major. By Capt. T. SPRATT, R.N., C.B., of H.M.S. 'Spitfire.'* July, 1854.

Communicated by Capt. WASHINGTON, R.N., F.R.G.S.

*Recd, June 23, 1856.*

KUSTENJÉ stands upon a level but elevated point of land that almost assumes the form of a peninsula. This peninsular form has been taken advantage of, by fortifying the extremity of the promontory with an entrenchment thrown across the narrowest



part to the sea-cliffs on the N., and to those over the bay or port of Kustenjë on the S.

The origin of the work seems to have been ancient, although no doubt frequently maintained as a line of defence in modern times. Massive walls of a Roman date, also, at one time, enclosed the summit of the peninsula, their foundations being at several places visible.

Beyond the entrenchment some tumuli and much broken ground exist also: the latter seems to have been the result of quarrying into the ground in early times for stone to build the city of Kostentino or to face a part of Trajan's Wall, running across the Dobrudsha, which wall, or entrenchment, terminates about 1 m. S. of Kustenjë. A broad flat or undulating grassy down extends for several miles W. of Kustenjë, and the only features upon this down are the long earth embankment of Trajan and two or three tumuli, the most elevated and most conspicuous of which stands on the plain about  $\frac{1}{2}$  m. from Kustenjë.

The little bay, formed by the point of Kustenjë, is shallow, and only five or six of the small class of transports could find shelter under it for the convenience of smooth water during strong northerly winds. The anchorage off it is, however, quite safe during summer; but in winter is not to be recommended as safe for any sailing vessel, and therefore the communication could only be maintained then, for the purpose of supplying troops with stores or provisions, by steam-vessels.

As a position for a dépôt of provisions for conveyance to the Danube it is well situated; but possessing an insecure anchorage, no fuel, but little water, viz. three wells, these detract from the value of the position.

The shores of the bay are rocky, so that it is not convenient for the disembarkation of horses by swimming them to land. There is a small stone pier and boat port capable of holding two or three paddlebox boats, at which a few horses may land at once with ease and safety. This pier was much improved and lengthened by Capt. Goldsmith, C.B., of H.M.S. 'Sidon,' during that ship's recent stay there. Other stone piers could be constructed, if required, the material being near. The walls of four stone-built magazines stand on the shore behind the piers, that were burned about three months since, with a quantity of grain in them, the ashes of which are still smouldering and occasionally in flames.

The town of Kustenjë is an assemblage of about 100 mud cottages, all thatched, of which many have been destroyed or greatly injured by the Cossacks. The street through them was the ancient paved street of the Roman city; the flagstones and pavement remaining in some places, and many fragments of the ancient

city lie scattered on either side, with two or three inscribed pedestals.

As a position of defence, its somewhat peninsular form, and the wide entrenchment across, give it some strength; but the broken ground and small ridges and tumuli beyond could be taken great advantage of by an enemy, when ships were not able to take up a shelling position off the town through bad weather.

At 2½ m. to the north-westward of Kustenjë is the small village of Anadol-Keui, and at 4 and 6 m. distant are the two villages of Pallas and Kanara, situated upon points of land which stand over a large lake of nearly 4 m. in length. The water of this lake is fresh and excellent, being supplied by several springs that rise in the shore at Pallas and elsewhere. The supply is so great as to form a small rivulet at its N. extremity, which, after turning one water-mill, flows into the sea in front of the small coast-village of Ma'muri, but the stream is not navigable for boats.

In front of Kanara there is a small island with a grove of trees, apparently the only trees within 20 miles.

The vicinity of this fresh-water lake to Kustenjë, which does not seem to have been noticed before, on the supposition perhaps that it was brackish, like all the lagoons adjacent to the coast, renders the deficiency of fresh water at Kustenjë less inconvenient as a position for the disembarkation of troops, or as a depôt for stores, &c., as the land over the S. side of the lake is sufficiently elevated to afford good camping-ground for an army; but a previous supply of wood by sea would be necessary.\*

\* The report of Cossacks in the vicinity of Kustenjë prevented our making an excursion in that direction, or ascertaining the depth of the lake with the view of its being made a harbour at any time, but we received the following information respecting the roads towards Hirsova:—

*Roads from Kustenjë towards Hirsova, viz.*

From Kustenjë to Kanara	..	..	..	1½ hours.
" " Kara Murat	..	..	..	3½ "
" " Bazarlik	..	..	..	5 "

At Bazarlik there is a fountain with a large supply of water.

Another route lies more to the north, which is well supplied with water, following the course of a river for 7 or 8 hours. The name of the river is the Tashul Deré-si, which empties itself into a brackish lake on the coast.

*Places and Distances on the River Tashul.*

Kanara to Tashul Deré-si	..	..	..	2½ hours.
" Keratchuk	..	..	..	4½ "
" Kotchukler	..	..	..	6½ "
" Kassadjí	..	..	..	9 "
" Hirsova	..	..	..	13 "
Kustenjë to Hirsova	..	..	..	14½ "

But these routes are without wood.



*Route from Kustenjë to Chernavoda.*

The direct road to Chernavoda is on the n. side of the valley of the Kara-su, which is now filled with a chain of lakes connected with the Danube for a distance of 15 or 16 m. The road is over ground of easy land-carriage the whole way, and is quite practicable for artillery, except during wet weather. But the country being one continued flat, or undulating down, like the steppes of Russia, producing a stunted grass, the beaten track need not be then followed.

On the supposition that Kanara would be made the first halt for troops or provision trains, the next might be made at the two villages of Alikapu and Burlak, although now for the most part destroyed. They are situated about 9 or 10 m. from the Kanara lake.

Each village contains about 40 wells, but which are turbid or putrid from stagnation during the last three or four months, or through the decomposition of contained animal or vegetable matter. These villages, before the arrival of the Russians, contained from 40 to 50 inhabitants, and being Turks, the habitations were chiefly destroyed by the Cossacks on retiring and the wells rendered impure.

One hour to the n. of Burlak there is a village called Doku-su, at which we were informed there was a small fountain with a stream that, from description, delivered about 1 gallon per minute. Not having visited the village, we are unable to offer any report upon the requirement for making it more serviceable than at present, or to verify the information given respecting it.

About a mile to the westward of Burlak, the chain of Kara-su lakes commence. The first is a stagnant marsh at this time, between which and the second there is an araba-road across the valley to the village of Chelabcha.

The second lake is an enclosed pool surrounded by high reeds, and the water cannot be reached, nor is it considered wholesome at this time by the natives, being, as we found, cut off from the lower lakes by a stagnant strip of marsh, over which a well-built bridge and causeway crosses the Kara-su valley. This is the main road into the Dobrudsha from the s. The bridge is 20 ft. broad, stone-built, has three arches, and a causeway approaching them of 100 paces on either side.

The lake, to the w. of the bridge, was very turbid and shallow, there being not more than from 1 to 2 ft. for several hundred yards out, and communicates with the next lake by a very shallow channel also, that may be in a few days dry, except for cattle. An araba-road crosses the valley also at this point.

The next lake is about 2 miles in length, and is in connection with a large one to the w., of about 7 miles in length, by a channel 70 yards broad and  $1\frac{1}{2}$  to 3 ft. deep. This channel has a hard bottom, and may be now crossed by cavalry and the country arabas; and the upper lake has a depth of 2 or 3 ft., but is in general shallower.

In a valley near its western extremity is a small hamlet of six or seven thatched cottages, with outhouses for cattle, called Chilibé-Keui; it stands about  $\frac{1}{2}$  m. from the s. shore of the lake, and is about 12 miles from Burlak. There is a good well at this village, and the water of the two large lakes is drinkable at this time, although turbid.

These lakes are now connected with the Danube by a river of nearly 3 miles in length, which meanders through the plain of Chernavoda, but the river appears to have been at one time barred by a ridge of stones across it, in front of the village; a part of which has been carried away by the force of the current so as to leave now only a channel of 12 ft. wide and 2 deep, although the average breadth of the river is from 60 to 70 ft. For 200 or 300 yards above the ford the bed of the river is shallow and obstructed by stones that have been scattered from the part of the ruptured ford or road.

The large lake was found to have a depth of 3 and 4 ft. generally, except near the entrance to the river, where it shallows for 200 to 300 yards to  $1\frac{1}{2}$  ft.; and on the 18th of July, when the river and lake were ascended in a flat boat by Col. Gordon and myself, there was still found water in them, and also down to the mouth of the river at the Danube. The surface of the lake was thus found to be at the level of the Danube at this time. From this fact, and from finding no streams or springs in the upper part of the Kara-su valley, coupled with the turbid nature of the water corresponding with that of the Danube, and also from the shores of the lakes bearing evidence of the water sometimes standing in them at least 8 or 10 feet higher than their present level, it is clear that the Kara-su lakes owe their origin entirely to the valley being lower than the elevated waters of the Danube, and with the rising of the river the waters flow in so as to render the condition of the lakes subordinate to its fluctuations. The state of the lakes and the river is at this moment just navigable for flat boats, the load draught of which does not exceed 15 inches; and if boats from 50 to 60 ft. in length and from 8 to 9 ft. beam were at hand, or constructed, and the mouth of the Chernavoda river immediately blocked by a dam or lock, these boats could for some-time be the means of effecting a very important water-communication from the tongue of land in front of Chilibé-Keui to Chernavoda, a distance of 10 or 11 miles. But unless this can be immediately



carried out, the probable fall of the Danube, with the daily advance of the dry season, will, by the middle of August, render it impracticable for navigation by the falling of the waters of the lakes also.

The town of Chernavoda contained about fifty families before the Russians entered the Dobrudsha.

The village is situated at the foot of a steep hill enclosing the north side of the valley, which is about  $\frac{1}{4}$  of a m. wide, and confined on the south by a similar ridge, both of which terminate abruptly over the Danube, their summits attaining an elevation of nearly 300 ft. Two mud forts, of three guns each, have been erected upon the top and side of the northern ridge, and another on the summit of the southern, and point up the Danube.

The Danube is here about 700 yards wide; the opposite shore low and swampy, with occasional thickets of wood.

On the 17th July, eleven or twelve brigantine-rigged vessels ascended the Danube to within 4 or 5 miles of Chernavoda, and anchored for the night. The next day they were seen by us distinctly, ascending by a branch through the swamps to the s.w. of Chernavoda, and apparently making towards Silistria; but their hulls were hid by the banks of the branch they were ascending.

On July 19th Chernavoda was quitted for Rassova, the road for which crosses the Chernavoda river by a wooden bridge 9 ft. broad and 26 long, built upon tall piles, at from 8 to 10 ft. apart, and supported by lateral props.

The road, at an hour from Chernavoda, descends into a valley with a small lake, on the edge of which is the large Bulgarian village of Yeni-Keni.

A stream from the lake of Yeni-Keni has to be crossed by a small wooden bridge near its mouth. The water of this lake, like that of Kara-su, is a back-water of the Danube, instead of being a tributary to it; and the inhabitants drink the water in the stream here also, as at Chernavoda, there being no wells at either, which may be adduced as a proof of the water in the lower lake of Kara-su being always drinkable and wholesome.

From Yeni-Keni the road ascends to an elevation of 100 ft. above the Danube, but finally descends to the marshy flat on the river side to Rassova, which is about 8 miles from Chernavoda. This last and lower part of the road would be very heavy in wet weather.

Rassova is an open Bulgarian town of 150 houses; it faces the s., and has only one tiled roofed building besides the church. A mud fort, for three guns "en barbette," stands at the foot of the hill to command the turn of the Danube, which here makes a large bend. The town has no walls or entrenchments enclosing it.

From Rassova the road to Kustanjé crosses two valleys and

two ridges, when it descends into the Yeni-Keui valley, in front of a marsh with tall reeds, and close to a recently-burnt chiflik. Two wells occur on this line; one near Rassova, and the other in the next valley.

A good road now ascends by the Yeni-Keui valley, in which, at 13 miles from Rassova, are two wells, one however dry; and at the 16th mile the large village of Mahmud Keui is reached, situated on the main road to the Dobrudsha from Bazarjik. It is also the main or best road to Chernavoda from the S., and both cross the Kara-su bridge.

Mahmud Keui possesses a fine fountain of excellent water, having four spouts, which together delivered  $5\frac{1}{2}$  or 6 gallons per minute. Twenty-one stone troughs, each 5 ft. long, were attached to the fountain, making together full 100 ft. of drinking troughs for animals.

The village of Mahmud Keui has a fruit garden of some promise and a small plantation of trees about 1½ m. distant, which is a proof of the capabilities of the land for bearing timber, if cultivated. But grassy downs, which however at this moment bear in many parts large crops of forage, are all that in general meets the eye on these undulating plains or steppes.

Between Rassova and Mahmud Keui, the valleys have patches of ripe corn in several places, and large crops of hay of a good quality could also be cut and gathered for winter forage.

Mahmud Keui, from its position and the possession of so valuable a source of water, might be made an important station in any movement on the Dobrudsha; but the absence of wood within many miles of it, would render it necessary to form a large store of fuel at the village, as well as the erection of sheds for sheltering men and cattle, before it could be of permanent use as a depôt or station on the march; and this supply of wood might probably be obtained from the great forest to the south of the Dobrudsha.

These routes to the Danube by the country conveyances would take  $3\frac{1}{2}$  or 4 days; but if a better mode of transport, by the use of easy and light carts and good mules, were adopted, such as exists in Malta or elsewhere, many of the difficulties at present perceived in respect to the transport-service across the Dobrudsha, would disappear.

The question of the navigability of the lakes of Kara-su has been shown to be a fact dependent on the state of the Danube and season.

In the dry months of August, September and October, the Danube being low, the lakes are low also, and may sometimes be disconnected from it, when evaporation would greatly add to their shallowness and reduce their limits, so as to render them mere ponds at these times.



These months being a part of the season most favourable for anchoring at Kustenjë, the preservation of the lakes in a navigable condition at this time, may be a point of much importance, and a point of very easy accomplishment by the construction of a simple lock, of not more than  $4\frac{1}{2}$  or 5 ft. in depth, near the mouth of the Chernavoda river, so as to confine the waters earlier in the season, when at a level of 2 or  $2\frac{1}{2}$  ft. above their present height. And it is evident that the removal of any shallow obstruction before a lock was made, would only render the drainage of the lake more complete at the dry season.

It is probable that another season of interruption to the navigation of the lakes, or on any system of canals attempted in this valley, would occur during the months of January and February, and probably later, by the freezing over of the still waters contained in them. This view, then, negatives the permanent practicability of a canal navigation to the Black Sea by this line, according to an often-suggested scheme, partly founded upon the notion that this was an old outlet of the Danube—an idea entirely erroneous, the valley being, in my opinion, originally one of displacement by a rent or fault.

# XVIII.—*Outlines of the Geography of Peru.\** By DON VALENTINE LEDESMA.

Communicated and translated by W. BOLLAERT, Esq., F.R.G.S.

*Geographical Position and Extent.*—Peru, under the empire of the Incas, comprehended that large tract of country situated in the western part of South America, viz. from Tumbes and Quito to the River Maule in Chile, and to Tucuman in the Argentine provinces. During the period of Spanish domination, several territorial changes were made, but at present the former possessions of the Incas are divided into the republics of Equador, Bolivia, Chile, a portion of the Argentine provinces, and Peru, the last being, in its present state, the largest of these republics, as well in territory, population, and commerce, as in maritime and land forces.

Peru lies between  $3^{\circ} 25'$  and  $21^{\circ} 30'$  s. lat. and  $68^{\circ}$  and  $81^{\circ}$  long. w. of Greenwich.† It extends from the Bay of Tumbes

\* See 'Observations on the Geography of Southern Peru, &c., by W. Bollaert, F.R.G.S.,' 'Journal Royal Geographical Society,' vol. xxi., 1851; 'Southern Peru, by W. B.,' 'United Service Magazine, 1843-9.'

† The author's positions have been altered from the longitude of Paris to that of Greenwich; the distances, from leagues to English geographical miles; the heights, from varas to yards.

and the province of Loja in Equador, on the N., to the rivers Loa and Desaguadero on the S.,\* which separate Peru from Bolivia, and from the shores of the Pacific on the W. to the frontiers of Brazil on the E.

Peru is about 1100 geographical miles in length. It has not been possible to determine its width hitherto, in consequence of the eastern portion being almost unknown: nevertheless the territory occupied by Peruvian citizens, except the extreme south,† is calculated at 240 geographical miles in width. It is also difficult to calculate its area, although some writers have estimated 41,420, others 100,000, and others 250,000 square geographical miles.

*Physical Aspect.*—A continuous sandy desert runs along the whole extent of the coast from Tumbes to Loa, and even to the Valley of Copiapo. Although generally arid as well as barren, and like those of Africa, this desert is traversed in the Peruvian territory by numerous valleys; the greater number, being more or less abundantly watered by rivers which rise in the western Cordilleras of the Andes, are remarkable for their fertility, and are occupied by the most flourishing populations of Peru.

This sandy waste on the coast is from 30 or 40 to 50 or 60 geographical miles in width, forming extensive plains traversed by arid ranges. This cisandine portion is known in the country by the name of the *Coast* (*la Costa*).

The andine portion is called the *Sierra*, or the *Mountains*, and, commencing at the foot of the western Cordillera, it terminates at the base of the eastern. From the coast the surface rises sensibly, and changes its aspect. This region is traversed by mountainous ridges which descend from the Cordillera, from the foot of which begin the valleys of the coast, following the course of the rivers. These valleys, in some parts, extend to the foot of the Cordillera, and contain important towns.

The western Cordillera is ascended by rugged paths to an elevation where the frozen *paramos* (Andean plains) are found, from which rise the colossal peaks of the Andes, many of them covered with eternal snow. The Cordillera is traversed through a broken

\* Generally rivers, mountains, and lakes are natural boundaries; and thus we say the river Loa is the southern boundary of Peru; but in reality the Peruvian territory extends some leagues beyond Loa, viz. 10 leagues of a useless sandy desert. The Desaguadero river is, like the Loa, the natural boundary, but Bolivia possesses to the west of the river the village of Copacabana, in the province of Chucuito, and department of Puno.

† The extreme south of Peru is the department of Moquegua, consisting of the narrow strip of territory between the coast and the centre of the Cordillera, bordering on Bolivia. A portion of the department of Puno is also thus bounded on the east by Bolivia. From Huancabaco or Pacasmayo—ports on the Pacific, in the department of Libertad—to Loreto, a port of Peru on the Amazon, the distance is at least 500 English geographical miles.



country, uncultivable and solitary, although not quite so much as the ascent of the last twenty leagues; the descent is to a territory lying between the western and eastern Cordilleras.

This territory is very varied in its aspect, climate, and productions. It contains considerable ranges from the Andes, many *paramos*, the table-lands of Titicaca and Bombon, ravines and valleys, some hot, others temperate; many lakes and rivers, and it is the most populous part of Peru.

From the eastern Cordillera extends the transandine country, commonly called the *Montana*, which is of a very different character. Here run innumerable rivers, some of the largest in the world. The vegetation is prolific, in the form of impenetrable forests and extensive plains, principally inhabited by hordes of wild Indians.

The country is divided by nature into three distinct parts: 1. The Cisandine; 2. The Andine; 3. The Transandine, called also the *Costa*, *Sierra*, and *Montana*.

*Mountain Systems.*—The mighty Cordillera of the Andes traverses Peru. From the mountain-knot of Porco in Bolivia proceed two chains,—the eastern, called Ancuma, runs between the province of Carabaya and Azángaro, in the department of Puno, and the western passes in Tacna, Moquegua, and Arequipa, to the knot of Cuzco, where they unite, enclosing the table-land of Titicaca, which extends from the Bolivian province of Carangas to Lampa, in the Peruvian department of Puno.

The mountain-knot of Cuzco is the most considerable in the Andes; in an area of 3000 square leagues it embraces the ranges of Vilcanota, Carabaya, Abancay, Huando, Parinacochas, and Andahuaylas, comprehending a great portion of the departments of Puno and Arequipa, and nearly the whole of those of Cuzco and Ayacucho.

From the knot of Cuzco branch off two other chains, which unite in that of Pasco; the eastern goes to the eastward of Huanta and Tarma, and the western to the westward of Castro-Vireyna, Huancavelica, and Jauja.\* In the knot of Pasco is the table-land of Bombon, at an elevation of more than 4100 yards above the sea. From this knot the chains depart:—the eastern passes between Pozuzo and Muña, and between the river Gullaga and Pachitea; the central between Gullaga and the Marañon; and the western between the Marañon and the coasts of Trujillo and Paíta. These three chains unite northward at the knot of Loja, in Equador. The western chain only, rises to the region of perpetual snow.

\* Mr. Arrowsmith places the range eastward of Castro-Virreyna (Virreina).—Ed.

In the western Cordillera of Southern Peru, in the departments of Moquegua and Arequipa, are situated the volcanos of Candarave, Ubinas, Omate, and Arequipa.

The culminating peaks in the Peruvian Cordilleras are in the western chain to the south, viz. Tacora, volcano of Arequipa, and the snowy peaks of Chacani and Pichupichu, with those to the right and left of the last-mentioned, which present a magnificent and imposing view; in the range of Vilcanota, the icy peak of Surupana; in the knot of Pasco, the peaks of Sacshuanata and Vinda; in the western chain of North Peru, in the department of Libertad, the icy summits of Pelagatos, Moyopata, and Huailillas.

The eastern Cordillera of South Peru, although narrower than the western, is a continuous chain of mountains always covered with snow, and presenting a sublime aspect, particularly in the Bolivian department of La Paz. To the south-east of Puno the snowy summits of Sorata and Ilimani, the most elevated in America, are scarcely inferior to those of the Himalaya in Asia. Covered with eternal snow, their colossal masses are seen from very great distances, surprising the imagination of the traveller, who remains astonished at the prospect.

*Lakes.*—Throughout Peru there are very many small lakes, but of little importance. Lauricocha is interesting as the source of the Marañon, and consequently of the Amazons; the Chinchacocha, or Lake of the Kings, which gives rise to the River Jauja, is renowned through the glorious battle of Junin obtained by the cavalry of the Liberating army over the Spaniards on the 6th of August, 1824; the small lake of Urcos, to the south of Cuzco, is the site of a tradition that the chain of gold, which was made to celebrate the birth of Huasca Inca, was thrown into it; but the only lake of great note is Titicaca.

Titicaca, surrounded by mountains, is on the table-land of the same name, between the departments of Puno and La Paz. It is 250 to 300 miles in circumference; 24 to 60 yards in depth; its greatest length, from s.w. to s.e., is 100 geographical miles, and its greatest width is 40 geographical miles. Its figure is very irregular; its superficial extent is estimated at 2200 geographical square miles. Its water, although unpleasant to the taste, is (potable) drinkable. Its height above the sea is 4282 yards.

In the Lake of Titicaca are several species of fish, such as amantos, suches, bogas, and others, which are sold, fresh and dried, by the Indians in the immediate markets, as well as in those of Arequipa, Moquegua, and Tacna. Those parts of the lake where there is little water are covered with bushes (enea), which give cover to multitudes of water-fowl. On the banks a



species of pasture, called *Uachu*, grows below the water, on which the cattle feed, and go into the water to get at it.

Many believe that the lake has tides (seiches), but hitherto no accurate observations have been made on this phenomenon. Violent tempests are known to occur.

The peninsulas of Capac-tica, or Capachica, and Copacabana are remarkable; also the isthmus of Yunguyo, at the extremity of which is the Strait of Tiquina, the large islands of Amantani, Taquiti, Soto, and Coati; the archipelago of Titicaca, composed of an island 7 leagues in circumference, with seven small islands surrounding it. The island of Titicaca was celebrated and sacred in the times of the Incas, through the belief that the Inca Manco Capac and his wife Mama Oello descended on it from heaven, to found and civilize the empire of Peru.

At a short distance from the city of Puno, situated on the western shore of the lake, is the island of Esteves, where the Spaniards had a fortress, in which they placed the patriot prisoners during the war of independence.

All the peninsulas and islands are fertile and abundant, yielding potatoes of various sorts, ocas, quinua, cañagua, pasture for cattle, and producing also a small quantity of maize, wheat, strawberries, guindas, vegetables, and flowers. This locality supplies with its productions a great portion of the departments of Puno and La Paz.

*Rivers.*—The rivers of Peru belong to three hydrographical regions, viz. Titicaca, the Pacific, and the Amazons. Titicaca receives all the rivers that run through the department of Puno, the principal of which are the Ramis, Coata, and Ilave. The Desaguadero flows from Lake Titicaca, and loses itself in Lake Aullagas, near Oruro in Bolivia, which has no known outlet.\*

The following rivers descend from the western cordillera and flow into the Pacific:—Tumbez, Chira, Sechura, Jequetepeque, Saña, Virú, Santa, Pativilca, Huaura, Pasamayo, Chillón, Rimac, Lurin, Mala, Cañete, Pisco, Ocoña, Camaná, Quilca, Tambo, Lon, and many others of a smaller class.

The third hydrographical region is that of the Amazons. This

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\* This lake is 10 or 12 geographical miles in length, and 6 in width, and called by the Indians Condocondo. It presents the phenomenon that, although the rivers Desaguadero, Maure, and others, run into it, the lake has no outlet; and it is thought that the waters sink, and then come out under the Cordillera, to the coasts of Iquique. In 1748 this lake so much increased that an inundation was feared; but after some time it resumed its natural bounds. In 1845 it again swelled, and it appeared as if the waters of the Desaguadero were running towards the Lake of Titicaca. On the southern shores of this lake, in the Bolivian territory, are the ruins of Tia-guanaco, testifying to the existence of advanced civilization in this country anterior to the foundation of the Incas' empire.

is the giant among all the rivers of the globe; its length is 3900 geog. m. from its source to the Atlantic, where its mouth is 140 geog. m. wide, between North Cape and Point Maguari; the volume of its waters being so very considerable that it repels the ocean for more than 100 geog. m.

This river is fed by numerous tributaries flowing through the countries between the Guayanas and the southern provinces of Brazil, embracing a great part of the republics of Venezuela, New Granada, Ecuador, Peru, Bolivia, and the empire of Brazil.

Various are the opinions relative to the source of the Amazons: some believe it is to the north of La Paz, in Bolivia, from whence comes the Beni, the principal branch of the Ucayali; \* others say, in the heights of Condorama, situated in the western cordillera, between Cuzco and Arequipa, where the Apurimac rises; and others think it is the lake of Lauricocha, which gives rise to the Marañon. The last is generally adopted.

The Marañon issues from the lake of Lauricocha, in the province of Huamalies, in the department of Junin, and 30 m. from the mines of Chonta. The Marañon has from its origin a most tortuous course from south to north. On its eastern bank are parts of the provinces of Huamalies, Couchucos, and Huari, all of Pataz, and part of Chachapoyas and Maynas. On the western bank are the other parts of the provinces before mentioned, as well as Huamachuco, Cajamarca, and Jean de Bracamoros. It bends to the north between Chachapoyas and Mainas, forming a large curve, starting from the port of Chuchunga de Jaen to the port of San Antonio.

Below Chuchunga sixteen *Pongos* occur, according to some authorities, and eleven according to others, the largest being that of Manseriche. The meaning of *Pongo* is a rapid, or waterfall, and it is derived from the Quichua word Puncu—signifying a gate.

The Pongo of Manseriche is about 7 m. long.

Of the innumerable rivers that enter the Amazons, mention will be made of the principal tributaries only. The first that flows into it from the right, is the Gullaga, which rises in the springs of Pucayacu, about 2 m. north of Cuzco. It passes by Guanuco, running towards the north, between the central and eastern cordilleras, to the town of Laguna, near which it meets the Marañon, and then runs over the Pongo of Chasata, a distance of about 7 m.

Then follows the Ucayali, uniting with the Marañon in front of the village of Omaguas. The Ucayali is formed by the great

\* See note, p. 216.—Ed.



rivers Pachitea, Apurimac, and Beni. The Pachitea is formed by all the rivers that run to the east of the eastern cordillera of Muña. The Apurimac receives the Urubamba and Paucartambo on the right; and the Pachachaca, Pampas, Mantaro, and Perene join it from the left. The Beni rises to the north of La Paz, flows to the south-east through the city, and passing by the foot of Illimani, turns to the north, joining in its course the Mapiri, Coroico, Tipuani, and Inambari, which descends by the province of Carabaya.\* The Ucayali, after receiving the Pachitea, Apurimac, and Beni, joins the Marañon, and the united streams then assume the name of the Amazons.

Then follow the Yavari, Jutay, Yurua, Coari, and Purus; the famous Madera, Topajos, Jingu, and Tocantin. The sources of these rivers are not known; still the principal streams of the Madera, viz. the Marmore, Guaporé, or Itenez, come from the interior of Bolivia, or may be from Matogrosso.

On the left bank, the Amazons receives the Morono, Pastaza, and Napo—these come from Equador; the Putumayo and Tapurá, from New Granada; the Negro, from the province of Angostura, in Venezuela; the Trompetas and Macapa, from the Guayanas.

*Sea, Capes, and Ports.*—The Pacific washes the whole of the coast of Peru. Near the coast are many small and deserted islands: those of Chíncha, Lobos, and others, are very important, as yielding guano—so valuable for agriculture, and producing a considerable revenue.

Cape Blanco, the only notable cape, is situated in the province of Piura. Nazen is a small promontory between the port of the same name and the inlet of St. Nicholas, on the coast of Ica.

The larger ports are Payta, San José, Huanchaco, Callao, Islay, and Arica. The smaller are Tumbes, Pacasmayo, Casma, Huacho, Pisco, Chala, Ilo, and Iquique.

The following are allowed to be open for the importation of guano used in agriculture on the coast, and for exporting farm-produce, viz. Sechura, Santa, Samanco, Huarmey, Supe, Chancay, Puerto Echenique, Ancon, Cerro Azul, Chíncha, Caucato, Nasca, Quilca, Cocotea, Morro de Sama, and Pisagua.

*Climate.*—In Peru every gradation of climate is observable; from the burning heat of Egypt to the icy cold of Siberia.

On the coast during the summer the heat is great, but it is not so in the valleys at the foot of the cordillera; in the mountains cold is felt, but vegetation extends up to the cordillera, where

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\* In Mr. Arrowsmith's and other English maps the Beni is made to flow from Illimani to the Madera river; but in the French atlas by Bruef it is delineated as a tributary of the Ucayali.—Ed.

perpetual cold reigns, and only a little wild pasture is seen. In the ravines and valleys of the mountains there is more or less heat, according to their elevation or being shut in by mountains. In the transandine territory the heat is constant.

The four seasons are well marked, although generally it is said that there is only summer and winter. Spring commences at the end of September.

The climate is generally pleasant; the great heat of summer on the coast is tempered by the sea and land breezes. Neither is the heat equal throughout the coast; in some parts, as in the department of Libertad and Piura, in the north, it is greater than in others.

In winter the sky is obscured by a dense mist, which deposits a slight rain called *garúa*, generally at night; the cold felt is not great, and does not stop vegetation; so that here many exquisite ripe fruits are produced in winter, which is rarely observed in other parts of the earth.

The highest temperature observed at Lima in summer is 85° Fahr., and the lowest in winter is 61° Fahr. In the Andes the thermometer varies according to elevation, but does not rise above 86° Fahr., and gradually falls to 25° Fahr. in the habitable parts of the cordillera.

Peru is especially exposed to earthquakes, particularly on the coast; the most disastrous were those of 1586, 1630, 1687, 1747, 1806, 1828. In the department of Puno earthquakes are scarcely known.

Summer is the rainy season in the mountains; in winter the sky is clear and the nights are very cold; in June much snow falls, and then, as well as in the rainy season, tempests occur, with hail-storms and formidable lightning.

In the Montaña, or transandine territory, it rains nearly throughout the year, and winter is unknown: in the summer the rains augment and fill the rivers, but in general the climate is healthy, and extremely favourable to fertility.

*Natural Productions.*—This is one of the richest countries in the world for the animal, vegetable, and mineral wealth. In the valleys of the coast and those of the interior all the species of quadrupeds and domestic birds known in Europe are bred. On the coast the breeds of horses, mules, pigs, cows, are excellent; and in Piura are goats, as well as the other animals already specified.

The plains and mountains of the interior are covered with herds of oxen, sheep, llamas, and alpacas. In the deserts of the cordillera exists the condor, one of the largest of the feathered tribe; also the precious herds of vicuñas and guanacos; but these are diminishing by continual hunting.



The transandine territory is distinguished by the great variety and number of its birds, many of them having beautiful plumage; also for animals, reptiles, and curious insects; while the rivers afford many species of fish of good quality.

Peru produces, in its various climates, all the fruits, grain, and vegetables cultivated in different countries, independently of those which are indigenous; the latter including many of exquisite flavour.\*

The transandine region is wonderful for the abundance and singularity of its productions. In its immense forests are ornamental woods in great variety, together with the Peruvian-bark tree, cocoa, coffee, coca, sarsaparilla, vanilla.

The mineral kingdom of Peru is celebrated for *placers* of gold and mines of silver, mercury, copper, lead, sulphur, and coal; as well as quarries of various marbles. Important are the gold placers of Carabaya, the silver mines of Pasco, Puno, Guantajaya,† and Gualgayoc; the mercury mines of Guancavelica and Chouta; the salt beds of Tarapacá, and the salt pits of Huacho and Sechura.

*Population.*—The population of this republic is above 2,200,000 souls.‡ Lima, its capital, is one of the most opulent and beautiful cities in Spanish America, and contains more than 80,000 inhabitants. It is in lat.  $12^{\circ} 3' \text{ s.}$ , long.  $77^{\circ} 6' \text{ w.}$ , Gr.

Amongst the other cities, besides Lima, remarkable for population and importance, are Arequipa and Cuzco; the first, situated at the foot of the volcano of the same name; the second, at the eastern extremity of the mountain knot of Cuzco.

The population is composed of several races, including the descendants of the old Spaniards, who are very few in number; the aborigines, who are numerous; and the Castas or Mestizos, who are a mixed race, uniting the aboriginal with more or less Spanish blood. This class and the first form the most active, intelligent, and important part of the people. There are negroes, free and enslaved; and also their descendants, mixed with the other races.

The number of each class of the population is thus estimated:—Whites, 240,000; Mestizos and dark, 300,000; Indians, 1,620,000; Negroes, 40,000; total, 2,200,000. Of the 40,000 Negroes there are scarcely 12,000 slaves.

\* Such as the chirimoya, pine, palta, which are among the finest fruits known in the world.

† See Proceedings Geological Society, vol. ii., p. 54, 1838, by W. B.

‡ By a census only can the amount of population be known; but such as is made in Peru is for the collection of contributions: thus a thousand opposing interests have the effect of diminishing the real number. According to the census of 1848 the province of Lima had 85,000 souls. It was, however, subsequently ascertained that it was more than 100,000.

*Languages.*—The Spanish is principally spoken, and is the only language on the coast; in the mountains, in addition to Spanish, the Quichua, an ancient aboriginal language of the time of the Incas, is spoken, and the greater part of the Indians know no other. The Aimara is spoken in the provinces of Chucuito, and Guancané in the department of Puno, and in the mountains of Moquegua. The Indians of the transandine territory speak various barbarous dialects.\*

*Political Division.*—The republic is divided into 13 departments, subdivided into 62 provinces, and 625 districts, containing 32 cities,† 74 towns, and 1558 villages.

The departments are Piura, Amazonas, Libertad, Ancas, Lima, Callao, Junin, Guancavelica, Ayacucho, Cuzco, Arequipa, Puno, and Moquegua. Piura and Callao are called litoral provinces. They are departments consisting only of one province situated on the shores of the Pacific; but their political organization does not differ from the rest. The transandine territory, nourished by the Amazons, Guallaga, and Ucayali, has been formed into the territorial government of Loreto, subdivided into the subordinate governments of Loreto, Nanta, Pevas, and Oran upon the Amazons; into those of Tingo-Maria, La Laguna, Tarapoto, Pachiza on the Guallaga; and those of Sarayacu and Santa Catalina on the Ucayali.

The capitals of the departments, and of the provinces into which they are divided, are the following:—

*Piura* consists of only one province.

*Amazonas.*—Chachapoyas is the capital; its provinces are Mainas and Chachapoyas.

*Libertad.*—Its capital is Trujillo; the provinces on the coast are Lambayeque, Chiclayo, Trujillo; those on the mountains are, Jaen, Chota, Cajamarca, Patáz, Guamachuco.

*Ancas.*—Its capital is Huaraz; the provinces are—Conchucos, Huari, Huaylas, Cajatambo on the mountains, Santa on the coast.

*Lima.*—Its capital is also that of the Republic; the provinces on the coast are—Chancay, Lima, Cañete, Ica; those on the mountains are—Canta, Huarochirí, Yanyos.

*Junin.*—Its capital is the Cerro de Pasco; the provinces are—Huamalies, Guanuco, Pasco, and Janja.

\* See a paper in the 'Journal of the Ethnological Society,' by W. Bollaert.

† In Spain the name of city did not indicate a greater population; but it was a title of honour, and gave privileges. In Peru, towns of considerable population are called cities, towns have a less population, villages less still; but this arrangement is not very exact, because there are towns more important than cities, and villages more so than towns: these terms are thus arbitrary.



*Guancavelica*.—Its capital is the city of the same name; its provinces are—Tayacaja, Guancavelica, Angaraes, Castro-Vireina.

*Ayacucho*.—Its capital is the city of the same name; its provinces are—Guanta, Guamanga, Cangallo, Andahuailas, Lucanas, Parinacochas.

*Cuzco*.—Its capital is of the same name; its provinces are—Abancay, Aymaraes, Cotabambas, Chumbivilcas, Urubamba, Anta, Calea, Cuzco, Pancartambo, Paruro, Quispicauchi, Canas, and Canchis.

*Arequipa*.—Its capital is the city of Arequipa; its provinces are—Camaná, Union, Cailloma, Condesuyos, Arequipa.

*Puno*.—Its capital is the city of Puno; its provinces are—Carabaya, Azángaro, Lampa, Guancané, Chureuito.

*Moquegua*.—Its capital is the city of Tacna; its provinces are—Moquegua, Tacna, and Tarapacá.

*Religion and Ecclesiastical Division*.—The religion of the state is the Roman Catholic; and although by the laws of the country the public exercise of any other religion is not allowed, in reality the country is not intolerant.

The Republic is divided into an archdiocese, and the bishoprics of Cuzco, Arequipa, Trujillo, Guamanga, and Chachapoyas.

The archdiocese comprehends the large departments of Lima, Junin, and Ancas, as well as that of Callao, with 150 curacies.

The diocese of Cuzco contains the populous departments of Cuzco and Puno, and 198 curacies.

The diocese of Arequipa contains the departments of Arequipa and Moquegua, with 66 curacies.

The diocese of Trujillo contains the departments of Libertad and Piura, with 96 curacies.

The diocese of Guamanga contains the departments of Ayacucho and Guancavelica, with 85 curacies.

The diocese of Chachapoyas contains the department of Amazonas, the province of Pataz in the department of Libertad, and the territorial government of Loreto, with 46 curacies, the greater number of them being missions.

*Political Condition*.—The government of Peru is democratic and centralised, founded on the principle that the sovereignty resides in the people, its exercise being delegated to the legislative, executive, and judicial bodies.

The legislative power is in the Congress, which is composed of two Chambers, one of senators elected by each province, according to its population; while the members of the second are chosen by the departments.

The executive is directed by the president, who is chosen by the electoral colleges of the provinces for six years. He has four

ministers for the despatch of public business—one for foreign affairs; one for finance; one for justice, benevolence, and religion; and one for war and marine.

The judicial power is dispensed by the Supreme Court of Justice held in the capital; by the superior courts of Lima, Cuzco, Arequipa, Trujillo, Ayacucho, and Puno; by judges in the provinces; and by magistrates in the districts.

There are special tribunals and judges for commerce, mines, finance, police (*comisos*), and the military.

The Council of State is a consulting body nominated by Congress, and charged likewise with maintaining the proper observance of the constitution and the laws.

The departments are politically governed by prefects, the provinces by sub prefects, and the districts by governors.

### *The Departments and their Provinces.*

*Piura* is bounded on the north by Ecuador, on the east and south by Libertad, on the west by the Pacific. Its population is 74,372; its capital, the city of Piura, contains 11,000 inhabitants, and is situated in  $5^{\circ} 13'$  s. lat.,  $80^{\circ} 35'$  w. long. The department contains 1 city, 4 towns, and 25 villages in the 20 districts, called Amotape, Ayabaca, V. Catacaos, V. Chalaco, Colan, Cumbicus, Frias, Huaca, Guancabambas, V. Salitral, Huarmaca, Morropon, Paita, Quercocotillo, Sechura, Sullana, V. Tambo grande, Tumbes, Ypatera, Suvo.

*Amazonas* is bounded on the north by Ecuador, on the east by the new government of Loreto, on the south and west by Libertad. Its population is 39,074; Chachapoyas, its capital, has 4000 inhabitants, and is situated in  $6^{\circ} 15'$  s.  $77^{\circ} 54'$  w. Its provinces are Mainas and Chachapoyas.

1. Mainas has 11,346 souls; its capital is the city of Moyobamba. In consequence of creating the territorial government of Loreto, this province is reduced to the districts of Moyobamba, Soritor, Balsapuerto, Lamas, Saposoa, Jeveros, and Andoas.

2. Chachapoyas has 27,728 souls; its capital has the same name as the department; it contains 1 city, 3 towns, and 64 villages in the 19 districts of Chachapoyas, Levanto, Jalca, Leiniebamba, Santo Tomás, Chuquibamba, Balsas, Pisugua, Ocalli, Yamon, Peca, Bagna chica, Bagna grande, Luya, Olto, San Carlos, Chisquilla, Chiliquin, Olleros, Guayabamba N., Rioja V.

*Libertad* is bounded on the north by Ecuador and Amazonas, on the east by Amazonas and Loreto, on the south by Ancas, and on the west by the Pacific and Piura.

Its population is 261,553; its capital, the city of Trujillo, has



5000 inhabitants, and is situated in  $8^{\circ} 75'$  s. lat., and  $79^{\circ} 4'$  long. w. of Gr. Its provinces are, on the coast—Lambayeque, Chiclayo, Trujillo; on the mountains, Jaen, Chota, Cajamarca, Pataz, Guamachuco.

1. Lambayeque has a population of 22,682 souls; its capital, of the same name, contains 10,000 inhabitants. It has 1 city and 15 villages in 10 districts, viz. Lambayeque, San José, Ferreñafe, Mochumi, Pacora, Morrope, Jananca, Motupe, Olmos, Salas.

2. Chiclayo has a population of 25,133 souls; its capital, of the same name, has 1 city, 1 town, and 15 villages in 14 districts, viz. Chiclayo, Moncefú, Eten, Lagunas, Jequetepeque, San Pedro de Lloco, San José, Chepen, Guadalupe, Pueblo Nuevo, Saña Reque, Piscí, Chengollape.

3. Trujillo has 7211 inhabitants; its capital city is of the same name, and the province is divided into 14 districts, viz. Trujillo, Mansiche, Huanchaco, Santiago de Cao, Magdalena de Cao, Paijan, Chocope, Ascope, Chicama, Simbal, Moche, Virú, Huaman, Mampuesto.

4. Jaen has 7211 inhabitants; its capital city is of the same name. The province contains 13 districts, viz. Jaen, Callayuc, Querocotillo, Colasay, San Felipe, Sallique, Bellavista, Cujillo, Chorros, San Ignacio, Tabaconas, Chirinos, Pimpincos.

5. Chota contains 62,597 souls; its capital is the town of Gualgayoc. It has 2 towns and 16 villages in the 12 following districts:—Gualgayoc, Chota V., Tacabamba, Pion, Cutervo, Huambos, Llama, Cachen, Santa Cruz, San Miguel, Niepos.

6. Cajamarca has 46,122 inhabitants; its capital, the city of Cajamarca, has 12,000 souls. It has 1 city, 4 towns, and 24 villages, in 12 districts, viz. Cajamarca, San Pablo V., Contumasa V., Cascas, Cusmango, Trinidad, Asuncion, Jesus, San Marcos, V. Tchocan, Celandin, V. Eocañada, Chetilla, Sorochocho, Magdalena.

7. Pataz has a population of 29,324; its capital is the town of Parcoy. It has 2 towns and 20 villages in 12 districts, viz. Parcoy, Soledad, Pataz, Bambamarca, Cajamarguilla, V. Uchumarca, Huayo, Chilia, Buldibugo, Huailillas, Tayabamba, V. Huancaspata.

8. Guamachuco has a population of 60,854 souls; its capital city is of the same name, with 11,000 inhabitants. It has 2 cities and 3 towns in 11 districts, viz. Guamachuco, Cajabamba, C. Otusco, V. Santiago de Chusco, V. Usquil, V. Lucma, Mollepata, Sincicap, Marcabal, Sartumbamba, Salpo.

*Ascas* is bounded on the north by Libertad, on the east by Loreto and Junin, on the south by Lima and Junin, and on the

west by the sea and Lima. Its population is 193,295 souls ; its capital, the city of Huaraz, in  $9^{\circ} 27'$  s.,  $77^{\circ} 45'$  w. Gr. Its provinces are Cinchucos, Huari, Huaylas, Cajatambo in the mountains, and Santa on the coast.

1. Cinchucos has a population of 54,751 souls ; its capital is the town of Siguas ; it has 2 towns and 11 villages, divided into 8 districts, viz. Siguas, Piscobamba, Pomobamba, Pallasca, Cabana, Tanca, Llpo, Corongo.

2. Huari has a population of 48,579 souls ; its capital is the town of the same name ; it has 1 town and 17 villages in the 9 districts of Huari, Huantar, Chavin, San Marcos, Huachis, Uco, Llamellin, San Luis, Chacas.

3. Huailas—its population is 84,616 souls ; its capital is the city of Huaraz ; it has 1 city, 5 towns, and 36 villages, in 20 districts of Huaraz, Yangas, Carlmaz, V. Ancas, V. Garaz, V. Pueblo libre, Huata, Mato, Huailas, V. Macate, Quillo, Pamparomas, Pariacoto, Pampas, Aija, Cataparaco, Pararin, Marca, Recuay V.

4. Cajatambo has a population of 24,799 souls ; its capital is the town of the same name ; it has 2 towns and 67 villages distributed in 12 districts, viz. Cajatambo, Chiquian, V. Mangas, Cochamarca, Gorgor, Cajacay, Acas, Ocos, Cochas, Ambar, Andajes, Churin.

5. Santa has a population of 5340 souls, its capital is the town of the same name ; it has 1 town and 9 villages in the 5 districts of Santa, Nepeña, Moro, Casma, and Huarney.

*Lima* is bounded on the north by Ancas, on the east by Junin and Huancavelica, on the south by Arequipa, on the west by the sea ; its population is 220,677 souls ; its capital is the metropolitan city of Lima ; its provinces are, on the coast, Chancay, Lima, Cañete, and Ica ; in the mountains Canta, Huarochiri, Yauyos.

1. Chancay has a population of 23,428 souls, its capital is the town of Huacho ; it has 2 towns and 39 villages, in the 10 districts of Huacho, Huara, V. Chancay, V. Sayan, Supe, Barranca, Pativilca, Iguari, Paccho, Checas.

2. Lima ; this province is composed of the city of Lima,\* and of its suburbs the villages of Magdalena, Miraflores, Chorrillos, Surco, Lurin, Pachacamac, Rinconada, Ate, Lurigancho, Carabaillo, including 100,000 souls.

3. Cañete has a population of 15,533 souls, its capital town is of the same name ; it has 1 town and 20 villages in 8 districts, viz. Cañete, Pacaran, Lunahuaná, Chinchalta, Chinchabaja, Codillo, Mala, Chilca.

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\* Lima is in  $12^{\circ} 3'$  s. lat., and  $77^{\circ} 6'$  long. w. of Gr. See Raper's Positions.—Ed.



4. Ica has a population of 38,000 souls, the capital city is of the same name; it has 1 city, 2 towns, and 10 villages, in the 7 districts of Ica, San Juan, Bautista, Yanca del Rosario, Hurnay, Pisco, V. Palpa, Nasca V.

5. Canta has a population of 14,384 souls, its capital city is of the same name; it has 1 town and 60 villages in the 10 districts of Canta, Araguay, Huamantanga, San Buenaventura, Lampian, Pacaraos, Pallac or Atabillos altos, Pasa or Atabillos bajos, Huayllay, Pomacocha.

6. Huarochiri has a population of 14,258 souls, its capital is the town of Matucana; it contains 48 villages in the 10 districts of Matucana, Huanchor, San Damian, Huarochiri, Quinti, Chorillo, Olleros, Santa Eulalia, Carampoma, Casta, Yauli.

7. Yauyos has a population of 15,264 souls, its capital is the town of the same name; it has 1 town and 42 villages in the 9 districts of Yauyos, Laraos, Pampos, Tauripampu, Omas, Ayaviri, Huañec, Viñac, Chupamarca.

*Junin* is bounded on the north by Ancas and Libertad, on the east by the transandine territory, on the south by Guancavelica, and on the west by Lima and Ancas. Its population is 220,949 souls; its capital is the city of Cerro de Pasco, the population of which varies according to the state of the mines; at present it contains 12,000 inhabitants, and it is in  $10^{\circ} 36' \text{ s.}$ , and  $75^{\circ} 48' \text{ w.}$  of Gr. Its provinces are Huamalies, Guanuco, Pasco, Jauja.

1. Huamalies has 32,027 inhabitants, its capital is the town of Llata; it consists of 1 town and 41 villages, in the 14 districts of Llata, Pachas, Obas, Baños, Chupan, Huacachucro, Huacaybamba, Singa, Chouta, Araucay, Jesus, Chavin, Mouzon.

3. Guanuco has 24,799 souls, its capital is the city of the same name, the old capital of the department; it contains 1 city and 23 villages, in the 6 districts of Huánuco, Santa Maria del Valle, Pano, Chinchao, Huacar, Hiqueras.

4. Pasco has 70,411 souls, its capital is the city of Cerro de Pasco; it has 2 cities, 2 towns, one of which is old Pasco, and 69 villages, in the 7 districts of Pasco, Tarma, C. Junin, V. Carahuamayo, Huariaca, Chacayan, Yanahuanca.

5. Jauja has 93,712 souls, its capital is the city of the same name; it has 2 cities and 93 villages, in the 5 districts of Jauja, Mito, Chupaca, Concepcion, Huancayo.

*Guancavelica* is bounded on the north by Junin, on the east and south by Ayacucho, on the west by Lima; its population is 79,117 souls; its capital is the city of the same name, with 5000 inhabitants, situated in  $12^{\circ} 54' \text{ s.}$ , and  $75^{\circ} \text{ w.}$  of Gr. Its provinces are Tayacaja, Guancavelica, Angaraes, and Castro Vireina.

1. *Tayacaja* has 27,318 inhabitants, its capital is the town of *Pampas*; it has 1 town and 28 villages, in the 8 districts of *Pampas*, *Huaribamba*, *Coleabamba*, *Surcobamba*, *Anco*, *Mayoc*, *Salcabamba*.

2. *Guancavelica* has 17,318 inhabitants, its capital has the same name as the department; it has 1 city and 18 villages, in the 4 districts of *Guancavelica*, *Acoria*, *Conaica*, *Moya*.

3. *Angaraes* has 20,300 inhabitants, its capital is the town of *Acobamba*; it has 1 town and 15 villages, in the 3 districts of *Acobamba*, *Juleumara*, *Lircay*.

4. *Castro-Vireina* has 14,348 souls, its capital is *Castro-Vireina*; it has 40 villages, in the 9 districts of *Castro-Vireina*, *Huachos*, *Arma*, *Chavin*, *Guangasca*, *Huaitará*, *Santiago*, *Cordova*, *Pilpichaca*.

*Ayacucho* is bounded on the north by *Guancavelica*, on the east by the transandiné territory, on the south by *Cuzco*, on the west by *Arequipa* and *Guancavelica*. Its population is 130,000 souls, and its capital is the city of the same name, with 16,000 inhabitants, in  $13^{\circ}$  *P* s., and  $74^{\circ}$  *w.* of *Gr.*; its provinces are *Guanta*, *Guamanga*, *Cangallo*, *Andahuailas*, *Lucanas*, *Parmacochas*.

1. *Guanta* has 26,358 inhabitants, its capital is the town of the same name, and 18 villages, in the 6 districts of *Guanta*, *Lari-cocha*, *Guamangilla*, *Tambo*, *San Miguel*, *Iquicha*.

2. *Guamanga* has 29,617 inhabitants, its capital has the same name as the department; it consists of 1 city and 29 villages, in the 9 districts of *Ayacucho*, *Quinua*, *Ascovinchos*, *Tambillo*, *Chiara*, *Socosvinchos*, *Santiago*, *Chungui*, *Anco*.

3. *Cangallo* has 20,027 inhabitants, its capital is *Cangallo*; it has 1 town and 52 villages, in the 11 districts of *Cangallo*, *Colea*, *Hualla*, *V. Canaria*, *Huambalpa*, *Oeros*, *Chuschi*, *Paras*, *Sarcoe*, *Carapo*, *Huancarailla*.

4. *Andahuaylas* has 19,184 inhabitants, its capital is the town of the same name; it contains this town and 31 villages, in the 9 districts of *Andahuaylas*, *Talavera*, *San Jeronimo*, *Huancarama*, *Chincheros*, *Ocobamba*, *Guancaray*, *Pampachiri*, *Cocharecas*.

5. *Lucanas* has 15,401 inhabitants, its capital is the town of *San Juan*; it contains this town and 53 villages, in the 11 districts of *San Juan*, *Pugnio*, *Pararsancoes*, *Santa Lucia*, *Otoca*, *Caramate*, *Ancará*, *Cabana*, *Chipao*, *Huacaña*, *Querobamba*, *Soras*.

6. *Parniacochas* has 19,334 inhabitants, its capital is the town of *Pauza*; it has 3 towns and 22 villages in the 10 districts of *Pauza*, *Orculla*, *Oyolo*, *Cotta*, *Lampa*, *Pararea*, *Pullo*, *Chuppi*, *V. Pacanpasa*, *Coracora V.*

\* The capital is named *Guamanga*, instead of *Ayacucho*, in some maps.



*Cuzco* is bounded on the north by *Ayacucho*, on the east by the transandine territory, on the south by *Puno*, and on the west by *Arequipa* and *Ayacucho*.

Its population is 352,798 souls, its capital is the city of the same name, with 40,000 inhabitants, in  $13^{\circ} 30'$  s.,  $72^{\circ} 5'$  w. of Gr.\* Its provinces are, *Abancay*, *Aimaraes*, *Cotabambas*, *Chumbivilcas*, *Urubamba*, *Anta*, *Calca*, *Cuzco* or the *Cercado*, *Paucartambo*, *Paruro*, *Quispicanchi*, *Canas*, *Canchis*.

1. *Abancay* has 21,912 inhabitants; its capital is the town of the same name; it has 2 towns and 13 villages in the 5 districts of *Abancay*, *Lambrama*, *Curaguasi*, *V. Pachirgua*, *Circa*.

2. *Aimaraes* has 18,228 inhabitants; its capital is the village of *Callhuanca*; it contains 49 villages in the 7 districts of *Callhuanca*, *Soraya*, *Calcabamba*, *Chapimarca*, *Tapairigua*, *Antabamba*, *Oropesa*.

3. *Cotabambas* has 23,241 inhabitants; its capital is the town of *Tambobamba*; it contains 40 villages in the 7 districts of *Tambobamba*, *Mara*, *Haquira*, *Huallati*, *Marmara*, *Chuquibambilla*, *Cotabambas*.

4. *Chumbivilcas* has 22,050 inhabitants; its capital is the town of *Santo Tomas*; it has 2 towns and 13 villages in the 3 districts of *Santo Tomas*, *Velille*, *V. Colquemarca*.

5. *Urubamba* has 34,949 inhabitants; its capital is the city of the same name; it has this city, 3 towns, and 15 villages, in the 6 districts of *Urubamba*, *Ollantaytambo*, *Ibuayapata*, *Santa Ana*, *Ocobamba*, *Echarati*.

6. *Anta* has 22,980 souls; its capital is the town of the same name; it has 1 town and 10 villages, in the 3 districts of *Anta*, *Zuriti*, *Limatambo*.

7. *Calca* has 14,223 inhabitants; its capital is the town of *Calca*; it has 9 villages in the 3 districts of *Calca*, *Pisac*, *Lares*.

8. *Cuzco*—this province is called the *Cercado*; it is composed of the city of *Cuzco* and its suburbs, with a population of 41,152 inhabitants; it is divided into 9 districts, one of which, *San Jeronimo*, is outside the city.

9. *Paucartambo* has 17,206 inhabitants; its capital is the village of the same name; it has 7 villages in the 5 districts of *Paucartambo*, *Catca*, *Caycay*, *Colquepata*, *Amparaes*.

10. *Paruro* has 17,732 inhabitants; its capital is the town of *Paruro*, and it has as well 30 villages, in the 5 districts of *Paruro*, *Huanoquite*, *Accha*, *Capi*, *Omache*.

11. *Quispicanchi* has 49,416 inhabitants; its capital is the town of *Urcos*; it has 27 villages in the 4 districts of *Urcos*, *Quiquijana*, *Oropesa*, *Acomayo*.

\* See R. G. S. Journal, vol. viii., p. 427.—Ed.

12. Canas has 37,605 inhabitants; its capital is the village of Coporaque; it has 10 villages in the 5 districts of Coporaque, Yauri, Checa, Langui, Yanacoca.

13. Canehis has 32,106 inhabitants; its capital is the town of Sicuani; it has 10 towns in the 6 districts of Sicuani, Marangani, San Pablo de Chaca, Tinta, V. Checacapi, Pampamarca.

*Arequipa* is bounded on the north by Lima, on the east by Ayacucho, Cuzco, and Puno, on the south by Moquegua, and on the west by the sea.

Its population is 137,509 souls; its capital is the city of Arequipa with 300,000 inhabitants, situated in  $16^{\circ} 13' \text{ s.}$ ,  $76^{\circ} 18' \text{ w. of Gr.}$  Its provinces are Camaná, Union, Cailloma, Condesuyos, Arequipa.

1. Camaná has 13,418 souls; its capital city is of the same name; it has 1 city, 2 towns, and 15 villages in the 13 districts of Camaná, Ocoña, Caraveli, V. Chaparra, Quicha, Huanuhuanu, Chala, Yanca, Jaqui, Atiquipa, V. Acari, Quileca, Siguas.

2. Union has 15,659 souls; its capital is the village of Cotahuasi; it has 23 villages in the 9 districts of Cotahuasi, Tomepampa, Alca, Huainacotas, Pampamarca, Charcana, Salla, Quichualla, Toro.

3. Cailloma has 23,446 inhabitants; its capital is the town of Cailloma; it has 22 villages in the 17 districts of Cailloma, Tesco, Collalli, Tuti, Chiray, Coporaque, Yanqui, Ichupampa, Achoma, Maca, Lari, Madrigal, Tapay, Cabanaconde, Lluta, Tura, Siguas.

4. Condesuyos has 21,170 inhabitants; its capital is the town of Chuquibamba, with 23 villages in the 14 districts of Chuquibamba, Viraco, Andagua, Choco, Chacas, Orcopampa, Cayarani, Andaray, Yanaquigua, Salamanca, Aplas, Huancarqui, Uraca.

5. Arequipa has 63,816 inhabitants, and the capital is that of the department; it has 23 villages in the 17 districts of Arequipa, Miraflores, Palomar, Yanahuara, Cayma, Pancapata, Sachaca, Sabaudia, Socabaya, Characato, Tiabaya, Uchumayo, Chiguata, Quequeña, Poesi, Vitor, Tambo.

*Puno*† is bounded on the north by Cuzco, on the east by the transandine territory and Bolivia, on the south by the latter, and

\* Query, lat.  $16^{\circ} 23' \text{ s.}$ —Ed.

† By a law of 1832, and subsequently, the provinces of Carabaya, Azangaro, and Lampo, in the department of Puno, were erected into a bishoprick. These had formerly belonged to Cuzco; the provinces of Guancané and Chucuito of La Paz are provisionally united to the bishoprick of Cuzco. Up to the present time neither of the governments have obtained the Pope's sanction for the erection of the new bishoprick.



on the west by Moquegua and Arequipa. Its population is 286,148 souls; its capital, the city of Puno, with 8000 inhabitants, is situated in  $15^{\circ} 50' \text{ s.}$ ,  $70^{\circ} 23' \text{ w. of Gr.}$ ; its provinces are Carabaya, Azángaro, Lampa, Guancané, Chucuito.

1. Carabaya has 22,605 inhabitants; its capital is the village of Crucero, and it has 14 villages in the 13 districts of Crucero, Usicayos, Coasas, Ayapata, Ituata, Corani, Macasani, Ollachea, Pahara, Patambuco, Sandia, Cuyocuyo, Quiaca.

2. Azángaro has 54,333 souls; its capital is the town of the same name, and it has 18 villages in the 16 districts of Azángaro, Asillo, San José, San Anton, Potoni, Muñani, Poto, Chupa, Arapa, Putina, Pupuja, Caminaca, Achaya, Samán, Santaraco, Puzi.

3. Lampa has 76,488 souls; its capital is the town of the same name; it has 3 towns and 41 villages in the 18 districts of Lampa, Pucará, V. Ayaviri, V. Orurillo, Nuñou, Santa Rosa, Macari, Cupi, Umachiri, Llalli, Ocuvi, Cabanilla, Cabana, Vilque, Atuncolla, Nicasio, Juliaca, Caracoto.

4. Guancané has 56,765 inhabitants; its capital is the village of the same name; it has 14 villages in the 11 districts of Puno, Guancané, Moho, Conima, Vilquechico, Inchupalla, Coata, Capachica, Pancarcolla, Tiquillaca, San Antonio.

5. Chucuito has 75,957 inhabitants; its capital is the town of Juli, and it has 25 villages in the 12 districts of Juli, Chucuito, Acora, Ilavi, Pomata, Lepita, Pichacani, Santa Rosa, Guaculani, Desaguadero.

*Moquegua* is bounded on the north by Arequipa, on the east by Puno and Bolivia, on the south by the sandy desert of the Rio Loa, which separates it from Bolivia, and on the west by the sea and Arequipa.

Its population is 61,440 souls; its capital is the city of Tacna, with 10,000 inhabitants; which is situated in  $17^{\circ} 10' \text{ s.}$ ,\* and  $70^{\circ} 10' \text{ w. of Gr.}$  Its provinces are Moquegua, Tacna, and Tarapacá.

1. Moquegua has 32,380 inhabitants; its capital is the city of the same name; it has 1 town and 6 villages in the 8 districts of Moquegua, Torata, V. Carumas, Omate, Puquina, Ubinas, Ilo, Ichuña.

2. Tacna has 18,642 souls; its capital has the same name; it has 2 cities and 18 villages in the 10 districts of Tacna, Arica, C. Codpa, Socoroma, Belen, Torata, Candaravi, Ilabaya, Locumba, Sama.

\* Query, Lat.  $18^{\circ} 10' \text{ s.}$ —Ed.

3. Tarapacá has 10,418 inhabitants; its capital is the town of Tarapacá; it has 28 villages in the 5 districts of Tarapacá, Iquique, Camina, Pica, Sibaya.

This province yields the large quantity of nitrate of soda used in agriculture and the arts; also the new mineral known as the borate of lime and soda.

# XIX.—*Observations on the Province of Tarapacá, South Peru.*

By DON M. B. DE LA FUENTE.

Communicated by W. BOLLAERT, Esq., F.R.G.S.

THE province of Tarapacá,\* situated at the extreme s. of the Republic of Peru and on the western side of the Andes, is very deficient of water, and may be called rainless. Iquique, the principal port, containing 1700 inhabitants, is wholly supplied with water by distilling that of the ocean. As nature has, however, been prodigal in diffusing over it many valuable productions, such as gold, silver, copper, tin, platina, cobalt, iron, quicksilver, guano, nitrate of soda, borates of soda and lime, alum, salts of various sorts, and other useful substances, it well merits the protection of the government and the continued efforts of science and art.

This section of Peru, probably the richest of its provinces, has excited much attention for the last 150 years, and was first brought into notice by the discovery of the silver mines of Huantajaya (a few miles only from the coast), to which those of Santa Rosa were soon added; these, with some few other mines, but little worked, have produced in a century 150,000,000 dollars = 30,000,000*l.*

At present the mines are nearly deserted, and have been left in the greatest disorder; the proprietors absented themselves in consequence of the revolutionary times, which, commencing in 1810, caused a want of workmen, who were drafted off to the wars.

Huantajaya and Santa Rosa are situated in the desert mountains of the coast, being supplied with provisions and water from long distances. In the once famous mines of Huantajaya the following are the only works in operation at the present time and on a small scale only:—

*La Mina de Lecaros*—the works are at the depth of 200 yards, the ores giving about 8*l.* in the 25 lbs.

The *Quebrada* mine is an interesting work, as it is entering new ground; great difficulties present themselves by reason of its great depth and bad ventilation.

\* See 'Observations on the Geography of Southern Peru,' by W. Bollaert. *Journal R. G. S.*, vol. xxi. 1851.—Ed.



*San Pedro and San Pablo* is an important work according to general opinion.

In the mineral district of Santa Rosa the following mines are worked :—

*Mendieta*.—A small quantity of ore is extracted, but it is expected to yield in abundance shortly.

*Luz*.—A cross cut of importance is driving in the direction of a vein in the Carmelitana mine.

*Grande*.—Rich metals are extracting, but in small quantities only.

There being no other mining operations in the province, it is said, and with some reason, that mining is abandoned, and that new discoveries only would be remunerative; but such can only be brought into work by native or foreign capital.

The existence of the inhabitants of the province of Tarapacá, about 12,000, and suffering under various commercial restrictions, is entirely due to the refining of nitrate of soda and to its exportation free of export duty.

The caliche, or native crude nitrate of soda, is found in layers several feet in thickness in an extended plain, 3500 feet above the sea, and in nearly a continuous line of 70 leagues, running n. and s. nearly parallel to the coast. Its distance from the various shipping ports of Iquique, Patillos, Mejillones, and Guayna Pisagua, is from 40 to 50 miles. Its quality and abundance throughout the line are pretty equal, that of the n. and s. being rather preferred. The principal refining works are near the quarries, and are La Novia, Peña, Sapiga, Pampa Negra, Nequros, and Sur, yielding annually about 600,000 quintals = 30,000 tons.

The same rude refining process, or the separation of common salt from the caliche, has continued without alteration since 1831, when this branch of trade commenced, excepting that English coal is used at places where wood is not to be had. Messrs. Geo. Smith and Co., of Iquique, are occupied in improving the process of refining, as well as in facilitating the transport of the nitrate from the interior to the coast, for shipment to Europe, &c. Since 1830 to 1852-3 about 300,000 tons have been exported.

The value of nitrate annually exported is 1,200,000 dollars = 240,000*l.*; but of this sum little remains in the province, for Chile takes 500,000 for provisions and timber; Lluta (a neighbouring district), in payment of beasts of burden, 100,000; Arica, for provisions, 40,000; Bolivia, for oxen, sheep, mules, asses, &c., 150,000; Tacua, Arequipa, and Lima, for goods from thence, 120,000; mercantile establishments, 150,000; thus the saliteros, or nitrate of soda quarriers and refiners, farmers, muleteers, and the other working population of the province, get about 110,000 dollars as their share.

The crude nitrate of soda is found combined with varying proportions of common salt, some sulphates of soda and lime (Glauberite), muriate of lime, and iodic salts. On arrival in this country it contains a small per cent. of impurities, as insoluble matters and moisture, 2.60+; sulphates, 0.40+; muriates, 2.00 = 5 per cent.

The borate of lime, which has lately been discovered, and offers a new branch of industry to the province, is met with generally under the beds of nitrate of soda, and near to where there is humidity. As yet this valuable substance has only been found sparingly; not more than 150 tons have been exported, but hopes are entertained that this mineral will be discovered in large quantities. The experiments on this new mineral have been most satisfactory, particularly as to its percentage of boracic acid. The following is the most recent analysis by Mr. Dick, under the superintendence of Dr. Percy:—Water, 27.22; sulphuric acid, 1.10; lime, 14.32; soda, 8.22; potash, 0.51; chloride of sodium, 1.65; sand, 0.32; boracic acid and nitric acid, by loss, 46.66, the nitric acid being about 1.00, with trace of phosphoric acid and iodine. This mineral is sometimes called Hayesine, tiza, and hydro-boro-calcite. Sixty pounds per ton and upwards have been paid for this article in London and Liverpool, by parties connected with glass-making, pottery, and smelting.

Guano is found in abundance on the coasts of the province from near Patollas to the River Loa, a distance of 30 leagues, there being but few intervals without it. Its exportation is prohibited by the government, and is only taken from the Pabellon de Pica, as a fertilizer, for the use of the province.

The agricultural operations of Tarapacá are on a very reduced scale indeed, in consequence of the great scarcity of water. The production of alfalfa, or herbage for animals, is only sufficient for 5000 to 6000, to which must be added dry pasture from Arica, and 50,000 fanegas of barley from Chile. Various hydraulic works might be effected: the most important projects are for bringing down more water from the mountains to the town of Tarapacá. Artesian wells might be sunk at Pica.

In the valley of Mani, adits might be driven into the surrounding hills, from which would flow sufficient water for all the land anciently under cultivation.

At Quilliagua, on the River Loa, canals or aqueducts are in course of formation for the purposes of irrigation. The difficulties of this enterprise are already conquered, and what remains to be done is easy of accomplishment.

Agricultural operations have commenced in the Pampa de Tamarugal, assisted only by the humidity arising from subterranean water: these are called "Chacras sin riego," or farms without irrigation.



It remains to propose the principal measures that should be adopted for the advancement of this interesting province. The port of Iquique, with an increasing population, ought to become the capital of the district instead of the town of Tarapacá, which has not 1000 inhabitants, and is very far in the interior. Iquique is the most important port and point of the province, particularly for the exportation of the nitrate of soda; and it should be made an open port by the government, instead of being, as it now is, under great restrictions. The importation of provisions, machinery, and tools for the various departments of industry, should be entirely free, until its own agricultural produce was found sufficient for its maintenance.

XX.—*Notes on the Bonin Islands.* By Captain MICHAEL QUIN, R.N., F.R.G.S.

*Essex*, April 28, 1856.

*Extract of Letters relative to Port Lloyd, Peel Island; one of the Bonin Group, in lat. 27° 6' N., long. 142° 16' E.*

June, 1837. H.M.S. 'Raleigh.'

[AFTER Captain Beechey's visit to and naming this island and port, and taking formal possession of the group, as per inscription in good preservation on a sheet of copper, as follows:—"H.B.M. ship 'Blossom,' Captain F. W. Beechey, took possession of this group of islands, in the name and on the behalf of His Britannic Majesty, George IV., 14th June, 1827."]\*

1830. The first settlers were Richard Millichamp, a native of Devonshire, and his partner Mateo Mozaro, of Ragusa, who had been many years in the employment of Mr. Bennett of Rotherhithe, near London, an owner of whale-ships in the South-Sea fishery, and had also served on board an English sloop of war, named 'La Morne Fortunée,' in the West Indies. They sailed from "Oahu," the 21st May, 1830, with two Americans, one Dane, and a party of Sandwich Islanders, viz. five men, ten women, in all twenty persons, with the countenance and support of Mr. Richard Charlton, his Majesty's consul for the Sandwich Islands, who supplied Messrs. Millichamp and Mozaro with an "union-jack," and a paper describing them as deserving persons, who had, at their sole expense and risk, fitted out an expedition to settle on one of the "Bonin Islands," as per accompanying documents. From the schooner that brought them from "Oahu" two Sand-

\* 1824. Capt. Coffin visited the southernmost group.—1825. Peel Island, in the central group, was visited by the English ship 'Supply.'—1826. The English whaler 'William,' Capt. Th. Young, was wrecked on Peel Island.—1826. English whaler 'Timor.'—1827. Capt. Beechey.—1828. Capt. Lütke.—1853. Commodore Perry.—Ed.

wich Islanders and one American deserted, increasing their numbers to twenty-three.

1831. The English ship 'Partridge,' Captain F. Staners, arrived; of her crew seven deserted.

1832. The English bark 'Walmer,' Captain Robins, arrived; of her crew one deserted.

1833. The English whaler 'Amelia Wilson,' Captain Wilson, was wrecked about 40' to the northward of Port Lloyd; three boats arrived with twelve men, of which number four remained. The English whaler 'Cadmus,' Captain Snowden, landed fourteen mutinous seamen; some of these had been shipped at Sydney, New South Wales.

1834. The English bark 'Fawn,' Captain Dale, left two English seamen, who, after remaining five or six weeks, re-shipped in a bark belonging to the same owners. The English ship 'Corsair,' Captain Venables, left two men. The English bark 'Daniel,' Captain Duncan, from which one of her crew deserted. The American ship 'Howard,' Captain Worth, left one man. The English bark 'Rochester,' Captain Price, from which one man deserted.

1835. The American ship 'Amazon,' Captain Cressy, lost four men by desertion. The English bark 'John Palmer,' Captain Lawrence, lost two men by desertion. The English bark 'Folkstone,' Captain Blisse, had one man desert.

1836. The U.S. ship 'Peacock,' Captain Strepling, with the broad pendant of Commodore Kennedy, had two men desert. The U.S. schooner 'Enterprise,' Captain Holding, had one man desert.

1837. The English bark 'Rochester,' Captain Kenny, had two men desert. The English bark 'Mellish,' Captain Cawley, had one man desert. The English bark 'Caroline,' Captain Wheeler, had one man desert. The English bark 'Admiral Cockburn,' Captain Lawrence, had one man desert.

The numbers on the island when the 'Raleigh' left Port Lloyd, 10th August, 1837, were as under:—

Names.	Born at	
Richd. Millichamp .. ..	Devonshire, Great Britain.	
Mateo Mozaro .. ..	Ragusa.	
Alden B. Chapin .. ..	Boston, United States.	
Nathl. Savory .. ..	" "	
Carl Johnsen .. ..	Copenhagen, Denmark.	
Seven men from the .. ..	Sandwich Islands.	
Thirteen women from the .. ..	" "	

In all of original settlers twenty-five, who arrived at Port Lloyd 24th June, 1830. Of after-settlers there were seventeen, including six children, giving thus a total population of forty-two in all on the island.



The Sandwich Islanders had bound themselves to labour for Messrs. Millichamp and Mozaro for a certain period. Messrs. Millichamp and Mozaro were of opinion that thirty more families—say three persons in each—could be comfortably and substantially located and fed, having besides a reasonable stock to dispose of to ships arriving, to supply themselves with clothing, tools, and a few dollars per annum.

The want of a fixed head, authorized by Government, was severely felt.

The "union-jack" given to Messrs. Millichamp and Mozaro by his Majesty's consul at the Sandwich Islands being quite worn out, and their flag-staff blown down, I considered it my duty to supply these deficiencies.

"Peel Island has already in good cultivation, sweet potatoes, Indian corn, onions, yams, pumpkins, water melons, and sugar-cane. Tobacco has been planted with such success that it is likely to give them a great deal of trouble from its spreading so fast, and the want of hands to gather it in and prepare it. It is said to be of excellent quality. A few good lemon-trees, planted from seed, bear well, but are neglected. Pigs are in great abundance. Wild hogs are numerous; also a breed of dogs from the Sandwich Islands are so well taught that they will at any time, under the direction of their masters, find, attack, and bring down the largest hog."

"The island has also many jungle fowl. Goats in a wild state are numerous on the Southern Head, which at high water is an island; no tame ones, save a pair left by the 'Raleigh.'"

"There are no noxious animals or snakes on the island; nor rats, but many mice. Sharks are numerous, but small: these the dogs frequently chase in shoal water, capture and drag high and dry on the sandy beach."

"Although the timber is in great plenty, there is none fit for masts: one sort called '*tomana*' is used for floors and planking and ornamental furniture. The mulberry-tree is very hard, and is used for posts and stanchions. There is also a small quantity of sandal-wood."

"Not the least vestige of previous occupancy has been discovered by the present settlers, who have now been resident since July 24, 1830, and have examined every part of the island. I am of opinion that Peel Island is one of the numerous islands in the North Pacific that has never been previously occupied."

*Average State of the Weather at Port Lloyd.*

January .. ..	Strong westerly winds, and clear weather.
February .. ..	} Moderate westerly winds, occasionally freshes and showers.
March .. ..	
April .. ..	Variable winds, inclining to E.; showers frequent.







*Average State of the Weather at Port Lloyd—continued.*

May .. ..	Winds more confined z. ; dry weather general.
June .. ..	Do. do. ; with occasional showers.
July .. ..	Heavy rains ; fresh gales from z. to s.z.
August .. ..	Do. do. ; occasionally heavy typhoons.
September .. ..	} Winds generally easterly ; do. do.
October .. ..	
November .. ..	Strong winds, generally s.z. ; but incline to s. and w.
December .. ..	Winds more regular ; fresh and westerly.

N.B. Typhoons in July, August, September, and October ; greatest strength in October.

XXI.—*Report by Assist.-Surveyor ROBERT AUSTIN, of an Expedition to Explore the Interior of Western Australia.*

Communicated by the COLONIAL OFFICE.

Read, February 11, 1856.

To the Hon. the Surveyor-General, &c. &c., Perth.

Western Australia, Perth, March 20, 1855.

SIR,—I have the honour to submit, for your examination and approval, and for the information of His Excellency the Governor, the following Report, briefly explaining the operations of the Expedition to Shark Bay ; and adverting to the geological structure, natural productions, water-parting, and general character of the interior of this colony to the s. and z. of the settled districts, and towards the Gascoigne River, described in the accompanying maps and journals, and explored by the party under my command, in pursuance of instructions received, by direction of His Excellency, from the Honourable the Colonial Secretary, dated 14th June, 1854, detailing the objects the Government had in view in despatching the Expedition, pointing out the course proposed for their attainment, and leaving me at liberty to pursue a different route, if I saw a corresponding advantage likely to accrue from any deviation therefrom ; provided I formed my plan subject to reaching the mouth of the Gascoigne, if possible, to meet the ship there at the appointed time.

The exploring party, under my command, consisted of ten men with twenty-seven horses, with one hundred and twenty days' provisions, accompanied by Mr. Woodward, who placed himself, with Mr. Chidlow's team, escorted by two men, for whom he brought forty days' rations, under my orders, to proceed to Cow-cowing, and convey my report of that country to head-quarters. We left Mombekine, 14 m. s.z. by s. from Northam, on the 10th July, and proceeded by way of Youlanging, where we crossed the Salt River ; travelling on a course s. 60° z., through gum-forests and sand-plains 15 m., to Goomalling, a spring and streamlet, at the s. end of a belt of granite country about 5 m. long and 3 m. wide, trending s., containing eight thousand acres of second-rate land, suitable for a horse run, watered by several streams flowing into the tributary plains of the Mortlock, or Salt River, and surrounded by scrubby sand-plains.

Travelling thence, on a course s. 3° z., over this land, and across a belt of elevated sandstone conglomerate, forming a scrubby forest, we entered extensive casuarina (swamp oak) plains, dry and hard, and strewed with trees uprooted, and water-marked 3 ft. high, indicating occasional heavy floods, flowing s. The country maintained this swampy character for 3 m., when we ascended a ravine called Walyurmuring, 911 ft. above the level of the



sea ; a grassy spot, watered by pools in a granite rock, forming a barrier across the ravine which connects the plain we had traversed with another of a similar description to the northward, which it drains.

Halting here for a day, in s. lat.  $31^{\circ} 11' 30''$ ,  $\pi$ . long.  $117^{\circ} 2'$ , in consequence of three of the Daren men (natives of Cow-cowing) and Gerip, a native of the country around the Wangan Hills, having joined us this morning ; when Gerip corroborated the accounts I had before heard of a good tract of grassy land extending from Kalguddering towards Gnyngarning, about 80 m.  $\pi$ . of Bebanoo, and I sent Messrs. Whitfield, Brown, and Woodward to visit and report upon this place, and the lead off to the northward, while I, through an interpreter, interrogated the Daren men, from whom I received a favourable description of their country around, and to the s.e. of Cow-cowing, and who expressed their intention of accompanying us through the thickets. Mr. Whitfield returned in the evening, reporting that Kalguddering, whence the Wangan Hills were visible, apparently 15 m. off, bearing s.x.w., in line with the southern group, was a patch of granite country, 14 m. s.x.w. from camp, affording 2000 acres of second-rate grazing land, watered by two springs, and surrounded by scrubby gum-forests and sand-plains ; while the intervening country, after leaving the casuarina plains around Walyurmuring, presented gum-forests and sand-plains, stretching far to the s., and swarming with kangaroo. Had this report been more favourable, I intended to have visited Gnyngarning, and travelled through this country on my return. Resuming our journey on the 14th, in company with three of the Toodyay natives, Gerip, and the Daren men, on a course s.  $76^{\circ}$   $\pi$ ., we travelled over undulating sand-plains 6 m., to a spring on the s. side of a salt lake, called Koombekine, 1025 ft. above the level of the sea, and found the country beyond this place so densely wooded that it was necessary to leave the cart here, in charge of the Toodyay natives, and make a détour on a course s.  $94^{\circ}$   $\pi$ ., along the sand-hills, on the s. side of some marshy thickets trending to the southward. After travelling 4 m. over these scrubby hills, we descended into a dense thicket of eucalyptus-wattles, growing on red and white sandy soil, extending 6 m., in which, with the exception of several knowow's, or native pheasant's nests—rings of sand and gravel, 10 feet in diameter, with a deep hole in the centre filled with narrow acacia-leaves, placed there by these birds to ferment, and form a bed sufficiently warm to hatch their eggs artificially—we saw no traces of birds or animals. It is singular that this thicket is below the level of the lakes to the eastward and westward of it. Emerging from it, we passed about a mile along the foot of a sand-hill, and bivouacked at a spring on the s. side called Hejanding. Steering thence s.  $93^{\circ}$   $\pi$ ., along the smooth gravelly shore of a small salt lake, surrounded by gum-forests, after travelling 4 m., we struck the s.w. shore of the great salt lake called Cow-cowing ; and, as it was skirted with dense eucalyptus and acacia thickets, while the bed was dry, I held my course over the s. end of the lake, forming two indenta, or bays, 6 m. across, presenting a yellow, saline sediment, covered with minute univalve shells and extensive patches of samphire, with round shallow holes, and separated by a narrow neck of land, from the summit of which the Binjemaring Hills bore s. about 10 m. off. The natives report permanent water and a patch of grassy country there, surrounded by sand-plains, in which kangaroos are numerous, though we have not seen any tracks of those animals since we entered the thickets. Notwithstanding the lake was dry we found it very heavy travelling for both men and horses, and I halted for the night on the eastern shore, at a well on the s. side of a sand-hill called Nalging, in s. lat.  $31^{\circ} 7' 54''$ ,  $\pi$ . long.  $117^{\circ} 28'$ , from the summit of which the natives view the extensive sheet of water on the s.w. side of the lake ; superstition and fear, based on the supposed existence of a large snake, that swallowed several black fellows whole some years ago, probably originat-

ing in these men having sunk in the soft bottom while travelling over the treacherous crust, deterring them from a closer inspection of that famous part of the lake; hence the conflicting and erroneous reports that have emanated from them relative to this place.

The well was drawn dry for the horses during the night, and in the morning I found that the sandy basin in which it was sunk was thoroughly drained. I crossed the lake, searching in vain for fresh water. Returning to camp I observed a sand hummock in the lake, and while I made arrangements to leave with Mr. Whitfield, Narryer, and Wooddang, to make further search if requisite, I sent three men to dig there. I found them 5 ft. down, picking at a hard cemented sandy floor similar to the bottom of a well, which Capt. Elliot, with a detachment of the 99th regiment and myself, sunk and found salt water in, while crossing Perron's peninsula at Shark Bay, in the summer of 1850, and knowing further efforts there were useless, I sent the men into camp, and pushed on through the thicket on the s.e. shore, to a place called "Twattergunyding," 7 m. s.e., where we found feed and water, and I encamped the party the following day. Here the lake presented three large arms stretching s.e., s.w., and s.w., falling from the s.e. and s.w. towards the s.w.; while on the s.w. side a large body of water was so little below the level of this place, which is 996 ft. above the level of the sea, that the water flowed back here during the prevalence of a s.w. gale. I observed the bed of the lake was cut up in every direction by emu tracks, converging to the rain-water splashes around Twattergunyding, on which several mountain ducks and painted teal were shot.

July 19th.—I left Mr. Whitfield in charge of the camp and proceeded, accompanied by Mr. Woodward, Narryer, and Wambinning, to examine the Cow-cowing Lake and surrounding country, steering s.w. We had some difficulty in crossing the lake now the water was blown over. The bottom in many places was like quicksand, and we had to pursue a circuitous route of many miles along the crooked belts of samphire and salsolaceous plants, to reach the opposite shore, where we entered a thicket of eucalyptus and acacia, morrell, gualack or cable gum, and thorny scrub, on hard bare red loam, studded with small salt lakes, extending about 12 m. on our course, and terminating in a dense eucalyptus wattle thicket, along the shore of the lake, at the foot of a patch of undulating granite country, where we bivouacked. Perceiving that we should be involved in thickets and salt marshes by holding our course to the northward, I determined to steer to the eastward and examine the country said to exist there favourable for sheep. Striking into the forest on a due e. course, travelling 7 m. through dense scrub and gum-trees on bare red loamy soil without a vestige of any grass, though the country has not been burnt for several years, we struck a dry arm of the lake flowing from the s.e., and crossed over 4 m. of samphire flats, forming its bed, to the opposite shore, where we entered another scrubby forest extending 6 m. on our course, and reached the shore of another lake trending s.w., with shallow pools of salt water and samphire beds. Our course led about 6 m. along the s. side of this lake, and then 12 m. beyond, through gum forest and scrub, to a group of granite hills called Wadduring, on the s.e. side of which the native led us to a fine running streamlet taking its rise at the base of the most prominent bare hill, and flowing through a small grassy flat, to the s.w.: while between this bare hill and a wooded range to the westward there was a fine grassy valley containing 50 acres of rich black loam and two permanent springs. Turning our horses loose here, I ascended the hill and obtained an extensive view, embracing all the places the Daren men had described, which, as Wambinning pointed them out, one by one, proved to be isolated granite rocks, affording only feed and water, at certain seasons, sufficient for a few horses en route to better country, and surrounded by dense scrubs. This was the



country the settlers of the eastern districts had been so long anxious to avail themselves of, relying on the favourable interpretation that resulted from inquiries among its hardy and cheerful inhabitants, who form a high opinion and give most glowing descriptions of any place that will generally afford them a rat and a draught of water. Returning to camp on the 24th I found all well, and moved the party to Wadduring, where we arrived on the 26th, and I halted a day to reconnoitre and give the horses an opportunity to fill themselves in this grassy spot. By observations of the sun and stars I found the highest summit of Wadduring (bare) hill in s. lat.  $31^{\circ} 00' 15''$  E., and long.  $117^{\circ} 59' 30''$  by chart; apparent elevation above the surrounding plain 250 ft.; while the camp at its base was 1236 ft. above the level of the sea by observations taken simultaneously by you at your house in Perth, and by myself at this place with Dent's aneroid barometers, and  $6\frac{1}{2}$  m. s.s.w. from Gylburn-gobbing (Mount Marshall) on your track from the eastward in 1836, and about 20 m. s.w. from Lake Brown.

I found, and on reference to the chart it will be seen at a glance, there was no inducement for me to push farther e. from this place, as Mr. Gregory had traversed to and from a point 90 m. to the s.e. of it; so I determined to make nothing by traversing the unexplored country between his outward and return track, and push vigorously to the north-eastward after I had cleared his work. In pursuance of this plan, we left Wadduring on the 27th July, and forced our way from granite rock to rock for water and feed, through gum forests and dense scrubs, to the high bare granite hill on Mr. Gregory's return track, in s. lat.  $29^{\circ} 53' 12''$ , e. long.  $118^{\circ}$ ; working between this parallel and  $118^{\circ} 12'$  of long., over ground rising from the lakes (1026 ft. above the level of the sea) on the s. side of Mount Marshall, to 1636 ft. in lat.  $30^{\circ} 26'$ , shedding its waters to the s.w. between lat.  $31^{\circ} 13'$  and lat.  $31^{\circ} 34'$ , and to the s.e. between the latter meridian and the high bare granite hill, to the base of which, 1205 ft. above the level of the sea, the country falls from lat.  $30^{\circ} 26'$ . Between the points last named there are no water-courses, and the scrubs are almost impenetrable. Along this track no springs or permanent water-holes could be found, nor do I think any exist, and we depended upon the precarious supply of rain-water accumulated in the hollows of the rocks, which are coarse amorphous breccia composed of felspar, quartz, and green stone. Fragments of these rocks cover the ground, and mixed with debris of red sandstone, the prevailing rock of the surrounding plains, form brown and red gravelly soils, strewed with small angular fragments of highly crystalline quartz, densely wooded with eucalyptus and acacia (wooruck and jam wattles), where the soil is red and loamy and the granite predominates, while melaleuca (tea-tree), wattles, and cypress-trees present formidable thickets, where the quartz and red sandstone rocks afford a yellowish brown light sandy loam, with small angular fragments of quartz. In the thickets of young acacia, on the better land, tufts of soft silk-like grass and slender rushes, such as the natives in the settled districts sew their cloaks and a bushman clears his pipe-stem with, grow luxuriantly; and a jointed grass, resembling couch, that the horses were very fond of, climbed and covered high bushes in the most shady spots. We arrived at the high bare granite hill on the 4th of August, where I halted the party five days to recruit my horses and make arrangements for sending Mr. Woodward with his team and escort to head-quarters, with a letter to you, reporting all well, the country traversed, and my determination to push into the interior and proceed thence to Shark Bay, to meet the ship at the mouth of the Gascoigne on the 17th October next.

August 11.—This morning I issued ten days' provisions, ten rounds of ammunition, three pack-saddles, and two double-barrelled guns to Mr. Woodward for himself and party, and instructed him to return on our tracks and proceed to head-quarters with my report, taking with him Mr. Chidlow's two

horses and a horse named Polly belonging to Mr. Phillips, to be delivered to their owners. At noon we were all in readiness to start, and Mr. Woodward and his party left us, with our hearty thanks for his kind and valuable services. Giving him a cheer as he entered the scrubs, we recommenced our journey, steering  $N. 25^{\circ} E.$  to a low granite hill 2 m. distant, at the  $S.W.$  extremity of this group of rocks, from which we steered  $S. 84^{\circ} E.$  through an opening in the salt marshes that stretched to the  $S.W.$  and southward. Travelling on this course 6 m. through scrubby plains, thickets, and salt marshes falling to the westward, we entered plains of red loam covered with quartz stones, wooded with acacia, eucalyptus, and casuarina, and extending 10 m. on our course to the foot of an elevated patch of rocky country, presenting conical quartz hills, resting on granite breccia and cliffs about 50 ft. high, the lower portion of which presented a glistening white rock composed of felspar and quartz grit, capped by red sandstone, forming a table-land covered with scrub. Our route here led through a thicket of acacia, casuarina, and gum-trees, on red loamy soil, covered with quartz stones, for half a mile, when we encountered another cliff of a similar description, facing to the  $S.$ , and passed through a stony defile, densely wooded, bounded by these precipitous rocks. The natives had broken down the bushes, and formed a rude fence about 3 feet high on each side of this defile, about half a mile in length, converging towards the eastern entrance, where there was a square hole 18 inches wide, with stout pegs driven in at the sides, to which they attach a net made of wattle-bark string, into which they drive the small animals that are very numerous in these thickets. Travelling over about 4 miles of tolerably level stony country beyond this place, we passed several new fences in the thickets, and saw fresh tracks of the natives who were constructing them, as well as a small bark cup they had left at a water-hole. At sunset we reached the hill for which we had been steering the last two days, and found it a rocky table-land, falling gently to the westward, covered with scrub and bare patches of honeycombed sandstone, and terminating abruptly to the eastward in a perpendicular escarpment 140 ft. high, presenting the same section and appearance as the cliffs we had passed. Some of the indentations or deep bays were nearly circular, and had the appearance of vast amphitheatres, to which the varied colours of the red and white rocks, furrowed by water that had deposited the denuded felspar in a broad sheet of white pipe-clay at the base, forming a glistening pavement, gave a lively and beautiful effect. Our dog brought a porcupine (*echidna hystrix*) to bay at the foot of these cliffs, where Mr. Guerin found this singular animal endeavouring to bury itself, while poor Turpin was barking and furious at pricking himself every time he tried to lay hold of it. Finding plenty of water here in the hollows of the rocks, we searched in vain for feed in the vicinity till dark, when we encamped for the night, and tied up the horses on the summit of the cliff, as the water was in places inaccessible to them, and there was great risk serious accidents would result from their being allowed to rove here, where the ground was intersected by deep ravines, covered with bushes. The ensuing morning, observing some broken country, with granite rocks cropping out round the red sandstone cliffs, 2 m.  $S.S.E.$ , we proceeded there, expecting to find feed for our horses, but as this, the most promising place, was as scrubby, stony, and destitute of grass as the country we had travelled over, I halted the party while I ascended the hill to make a reconnaissance before proceeding farther. It was then raining so hard that the country around was enveloped in thick mist. However, after waiting a short period, I could see that the country was more open and favourable to the  $S.S.E.$ , and moved off with the party in that direction to some salt marshes 4 m. distant, where I found some coarse salt feed, and turned the horses out to graze. It rained



heavily all day and night, and we had great difficulty to prevent the horses straying back on the track. These salt marshes, in s. lat.  $28^{\circ} 20' 30''$ , e. long.  $118^{\circ} 15'$ , were 1104 ft. above the sea, and, falling to the westward, stretched to the verge of the horizon e. by s. and w. by s. The coarse feed, cold, and wet combined, gave several of the horses the gripes the following morning, when we proceeded on the same course, s.e. 12 m., over undulating, stony, scrubby country, and Mr. Kenneth Brown, who was in advance with me, caught a glimpse, through a vista in the thicket, of an elevated range of table-shaped and peaked hills, similar in appearance and contour to the Champion Bay country. This was a welcome discovery. Looking through the telescope, I thought it promised well, and determined to proceed there. I found its bearing s.  $10^{\circ}$  e., and apparent distance 30 m. By this time the whole of the party joined us, and, as soon as the good news was communicated, they pushed on in high spirits. We named the highest table-land Mount Kenneth, after my young friend who discovered it. Traveling through dense thickets, we entered a descending country, destitute of water, in which all the bushes were dead or dying, and fell crashing before us, staking several of the horses, and the grass was dry and dusty from two or three years' drought at least. Had it not been for the promising country ahead, it is probable we should have been dispirited on this occasion, and I felt thankful for this gleam of hope and its cheering influence on my weary companions, though my own conviction was, judging from the gradual inclination of the incumbent rocks dipping to the s. and w., that the upheaving primary rocks cropped out far to the northward and eastward of the place we were steering for, which, at best, could only be a transition country, forming second-rate land, which, though a vast improvement on the sandstone formation we had been traversing, would only be of use to the colony by affording valuable mineral deposits or pasture for stock en route to a better country beyond.

We saw no more of Mount Kenneth till the following night, when we emerged from the scrubs and entered an open plain, and found water and feed in a rocky gully 12 m. s. of it, where we halted, and then pushed on over stony plains, rising as we advanced, crossing some rugged scrubby greenstone hills midway, to the foot of the mount, where we found it and the surrounding table-hills of sandstone formation, capped by ironstone, and covered with scrub. Observing a grassy stream-bed, with small pools of water in it, e. by s., about a mile from Mount Kenneth, I moved the party on and encamped them. Here I halted the party two days to recruit them and the horses, inspect our stores, and make necessary alterations and repairs. By meridian altitude of the sun during the day and a Lyra in the evening, I found the latitude of the mount was  $28^{\circ} 57' 11''$  s., and long.  $118^{\circ} 20'$  e., and obtained a commanding view from the summit. Far as the eye could range to the s. and e., sandstone flat-topped ridges, trending s.e., and presenting façades of a white hue, capped by overhanging rocks of a red colour, clothed with acacia scrub, strewed the extensive stony plains in that direction, through which, here and there, peaked white hills of stratified quartz rocks, inclining to the westward and resting on greenstone, jutted out in association with several amorphous masses of breccia composed of sienitic granite and felspar. From s.w. to w., on a radius of 30 m., low rounded hills of trap formation, apparently greenstone, covered with scrub, gave the country in that direction an undulating, scrubby character; while to the southward, the country we had traversed presented scrubby waves, rolling to the verge of the horizon. The summit of this hill was 180 ft. above the level of the surrounding plain, which was 1401 feet above the level of the sea, and intersected by several watercourses trending s.e., all now dry, and

presenting rocky beds, though not deep channels, as the rocks are close to the surface. The main stream was 50 ft. wide, and evidently shed the waters of this country into the lakes we crossed in s. lat.  $29^{\circ} 29' 30''$ .

The following specimens of natural history were procured here by Mr. Brown, and preserved, viz.:—Two white owls, with small brown spots on the back of the neck and wings (*Strix delicatula*), two cinnamon-coloured ground thrushes (*Cinamonus cinclonoma*), three small brown parrots with slate-coloured breasts (*Euphemia Bourkii*), a very small scarlet bird (*Epthianura aurifrons*), and a small rat (*Apalotis Mitchellii*). I saw a small tree among these hills, in form and size resembling a fig-tree, with pear-shaped seed-pods hanging point down, and radiating from a common process at the base of the leaf-stalks. Subsequently I saw large quantities of these seed-pods at the fireplaces of the natives, and I believe they eat the seeds.

The following extract from the meteorological journal shows the range of the barometer (aneroid) and the thermometer (Fahrenheit's), and the weather, during the period we were encamped at Mount Kenneth:—

August 17, 8 A.M., barometer  $28^{\circ} 25'$ ; thermometer  $42^{\circ}$ ; wind s.w.; rain.  
 " 8 P.M., barometer  $28^{\circ} 30'$ ; thermometer  $48^{\circ}$ ; wind s.w.; cloudy.  
 " 18, 8 A.M., barometer  $28^{\circ} 30'$ ; thermometer  $48^{\circ}$ ; wind s.w.; cloudy.  
 " noon, barometer  $28^{\circ} 27'$ ; thermometer  $58^{\circ}$ ; wind s.w.; rain.  
 " Heavy showers till 6 h. P.M.  
 " 6 P.M., barometer  $28^{\circ} 30'$ ; thermometer  $50^{\circ}$ ; wind s.w.; clear.

August 19.—We resumed our journey, steering s.e., as I now considered the change in the formation of the country favoured my pushing boldly in that direction towards the outcrop of the primary ridge, which appears to have suddenly elevated this portion of the continent, and disturbed the level of the primeval ocean in which it was submerged, that rolled from e. to w., sweeping away the torn country and loosened hills in its course, and thus denuded the vast area we had traversed of the superincumbent rocks, many hundreds of feet in thickness. Our course, for 6 m., lay through broken country, presenting sandstone cliffs, quartz, round scrubby hummocks of black shining iron ore, and stony plains, wooded with acacia and sandal-wood trees, and drained by a stream 30 yards wide, trending s.e., the bed of which was dry and shallow, like an arm of a lake, and presented a white, glistening bottom, composed of felspar. Travelling thence, through acacia and cypress thickets, on undulating, stony, and red loamy soil, we struck extensive salt marshes, trending s. and e., 3 m. across, perfectly dry, and presenting a sound, but soft and heavy bottom for our horses.

Here I observed the country was less densely wooded in a line with a white patch of rocks bearing s.  $70^{\circ}$  e., and steered towards them. Crossing this marsh was heavy work for the horses: they sank up to the knees, every step, in the soft, yellow, saline sediment, and had to step quick, or they would have been up to their girths in it, though it was dry and dusty; however, they struggled through with great courage, and maintained this trying pace bravely, till they reached the opposite shore, when they were fairly blown. Breathing them a few minutes there, we pushed on again, in hopes of finding grass and water for the poor animals; but the thicket became more dense and unpromising as we advanced, and, when night approached, I halted in the scrub, and tied them up for the night without either. Having had so much rain recently, I depended upon finding plenty of water everywhere for several days, and was surprised when I found that the parched land had absorbed it so rapidly.

The next morning we steered s.e., through an almost impenetrable thicket, to the right and left of which still denser cypress scrubs presented hard, wall-like fronts. The horses were so jaded that our pace did not exceed a mile an hour. At this pace, hour after hour, we plodded wearily



through this wretched country. At length the soil changed from stiff red loam to red sandy loam, and we reached a more open country, covered with low acacia scrub, after travelling about 3 m., when the cypress thickets trended round to the southward, sending out a few spurs only in the direction we were travelling. Wishing to avoid even these, if possible, I ascended a bush to reconnoitre, and sighted a patch of granite rocks, 3 m. off, bearing S., for which we steered at once, and arrived there at 11h. 40m. A.M. We found water and feed, and bivouacked for the day to rest the horses. While the horses were unloaded here, I obtained a meridian altitude of the sun, and found our position in s. lat.  $28^{\circ} 43' 23''$ , long.  $118^{\circ} 38' E$ .

From the rising ground behind the camp Mount Kenneth was visible, and the summit of an elevated group of round-topped hills loomed blue in the distance, bearing S.  $\frac{1}{2}$  E., about 15 m. off. I determined to proceed to these hills the next day. To the eastward, the country was gently undulating and very scrubby. There were three patches of bare, rounded, red granite rocks here, and a small spring at the base of the most southern group, close to the bivouac. Abundance of silky grass grew in tufts in the acacia thickets around, and very coarse grass was growing in the clefts of the rocks, the roots of which, when pulled up, emitted a pungent odour, something like ammonia.

The following morning two of the horses strayed away. Expecting they would be speedily tracked up and brought in, we saddled, and had the horses standing between the loads, ready to have them put on directly the ramblers arrived. It was noon, however, before they were brought in. Narryer, who had brought in one horse, reported he had broken one of his hobble-straps, and gone off 9 m. to the westward. Souper found the other horse in a patch of grass in a rocky gully 3 m. S.W. As it was now too late to push on to the hills 15 m. S., and the horses had been saddled up all the morning, I determined to leave their loads here, and take the horses to the place Souper had found, so that they might start the next morning in good heart. Accordingly, at 1h. P.M., I started, with Messrs. Whitfield, Brown, Guerin, Buck, Farmer, and Souper, with the horses only, leaving the other men, with Mr. Fraser, in charge of the camp. We had not proceeded far, when Mr. John Hardley's horse reared and fell, kicking violently, among the rocks. In an instant, four other horses were spinning in the air, and fell, plunging violently when they were down. By the time the other horses that required to be tied up were secured, their prostrate companions were quiet, and, seeing it was poison they were suffering from, we bled them freely, which seemed to afford immediate relief, though they were unable to rise again for three or four hours. Scarcely had the foams been wiped, when my own two horses were reeling and stupified, and obliged to be bled also, and left with the others in charge of Mr. Guerin. As it was not safe to turn the horses loose in this vicinity, I sent Mr. Whitfield on with the other horses to Souper's Flat, instructing him to bleed any of them that staggered, and tie them all up till I joined him. I then returned to the camp for the tether-ropes and some medicines, and proceeded with them, in company with Mr. Fraser, to the flats, where I found Mr. Whitfield, who reported having bled two other horses before my arrival. The grass here was of the same description as that described growing on the rocks near the camp, and the poison-bushes were growing along with it everywhere, so that we had to cut them up with our hatchets to clear two tethers for each horse. This poison-plant is a species of *gastrolobium*, with a small, bright, orange-coloured peablossom, like birds' eyes. The leaves are opposite and spreading, 2 inches long, wedge-shaped, with a triangular apex, at each angle of which, and at the base of the leaf, are small thorns, and the breadth at the base of the apex is half an inch. The average height of the bushes is 3 ft., though many are

much larger. This is the first instance I know of horses having been seriously affected by this plant. Some years ago, Dr. Harris gave a large quantity of it to a pony without injuring the animal. I am, therefore, disposed to think my horses were so seriously affected in consequence of their stomachs being empty and weak.

The other horses were too much weakened to carry their loads, and, as there was no chance of their improving in condition where they were, I determined to move them to a better place as soon as possible, and leaving eleven horses that could not travel in charge of Messrs. Whitfield, Duck, Farmer, Narryer, and Edwards, whom I also left in charge of the camp and stores, with instructions to procure grass from the thicket at hand, wash the roots, and feed the horses on them, if they were hungry, or on a little flour-gruel, till they gained strength, I pushed off with the rest of the party and ten days' rations, leading the rest of the animals, sixteen in number, steering  $s. \frac{1}{2} w.$  towards the hills seen in that direction. Travelling 9 m. on this course through stony undulating country, wooded with acacia, we entered a sandy plain, covered with dry, soft grass in tufts under acacia bushes, affording better feed than we had seen for several days, though it was very indifferent. Here I halted, and turned the horses out to feed. Soon afterwards I found it necessary to have four more horses bled, as their heads were swollen, and they were just going to spin. There now remained only eleven horses unaffected, and these, unfortunately, were the weakest. During the afternoon and night the rain poured down in torrents. The wind was from the  $s.w.$  The next morning the horses were tucked up like racers, having been standing up all night during the storm without feeding. I therefore allowed them to graze till 10 a.m., when we resumed our march through dense scrubs to the stony plains around the foot of the hill, where we saw old tracks of red kangaroo, in well-beaten paths 18 inches wide, and put up several gnaws. After watering the horses *en route*, I observed they scoured very much, and several were griped. Under these circumstances I kept them moving very briskly. Arriving at the hills, I found their elevation less considerable than their appearance from a distance led me to expect, their great apparent height being attributable to the gradual rise of the country in the direction we were travelling. Ascending them, I found they were of foliated greenstone formation, about 200 ft. above the plain, very scrubby and rocky, and that there was not a blade of grass on them. A range, of a similar description, lay 2 m. to the  $w.n.w.$ , and a group of ironstone hills 2 m.  $s.s.e.$ , nearly of the same elevation, and covered with dense scrub. To the northward, open acacia plains extended to the foot of a range of hills 12 m. off, the summit of which bore  $s.s.e.$  As the most favourable country intervened, I determined to steer towards these hills, and halt at the first suitable place I could find *en route*. Descending from the hill at 2 p.m., we found the plain composed of good, light, red loam, very stony in many places, and covered, in most, with dry perished grass, presenting an appearance that induces me to believe this is the first heavy rain that has fallen here for two or three years. There were several burrows like boudy holes, inhabited by animals whose tracks resembled those of the dalgite, in these plains, the earth around and thrown out from which was perfectly white, and presented the appearance of lime, though it was really decomposed foliated greenstone, which assumes this colour when exposed to the atmosphere, giving the hills composed of it the look of quartz hills, when viewed from a distance, as it is only when fractured that the brilliant green lustre of the rock is developed. The prevailing rocks on the plain were quartz and ironstone; but the soil beneath was rich and deep, and in a favourable climate would most probably have been very fertile. Not a trace of natives having recently visited this country, or even the smoke of a distant fire, could be seen here, nor have we seen anything of



the kind since Mr. Woodward left us; and I am, therefore, induced to think that the great scarcity of water has obliged them to abandon this desert country. At 5 P.M. we passed a rocky hill, presenting slopes of dislocated granite, blended with greenstone. This laid on our left, our course leading between it and a huge pile of large granite rocks, heaped in a cone 90 ft. high. Soon afterwards we struck a small samphire and salt bush flat, half a mile from the base of the hills we were steering for, and, finding water and grass, bivouacked there for the night, having marched 21 m. I then pushed to the summit of the hill, to obtain a view of the country beyond. The surrounding hills prevented my obtaining such an extensive view as I had anticipated. A more rugged hill than the one I ascended can scarcely be conceived. Had it not been for my gun-sling, I must have ascended unarmed. Large square blocks of granite and greenstone were piled confusedly together to a height of 250 ft., in masses so perpendicularly and awkwardly placed, that it was only by climbing the bushes and springing from them on to the rocks I managed to accomplish the ascent. From W.S.W. to E., over an area of 4 m., detached groups of hills of a similar formation formed rocky, undulating country, wooded with acacia, with only one break affording a view of the country beyond, through which I caught a glimpse of a high range of hills, bearing S. 6° W., apparently 20 m. distant, to which I proceeded the following day.

Travelling through the 4 miles of broken country above mentioned, and the scrubby plains 3 miles beyond, we entered level, open plains, covered with salt weeds and coarse grass, and a tolerable supply of water, owing to the recent heavy rains. If the water would last, I saw I could recruit my horses here, but as they were tolerably full and fresh now, and the range ahead promised something better, I pushed on, over black iron ore and sharp gravel, through a dense thicket, that stretched from the northern side of these plains, that I subsequently called the Recruit Flats, 13 m. to the foot of the range, which we reached at 5 h. 30 m. P.M., and bivouacked on a small patch of dry grass, in a thicket at the base of the eastern side, abreast of the highest summit, formed by the shed of a rocky gully that flowed down the side of the hill, and, spreading over, fertilised this spot; but the bed of this streamlet was dry, and the grass sapless and dusty, apparently very old, and it was only on the salt bush and acacia spray that the horses fed. The base of this hill was 1569 ft. above the sea, and the elevation of the summit 400 ft. above the plain. The range, in which it formed the prominent feature, presented several conical summits of less elevation, grouped 5 or 6 m. on each side in the form of a crescent, facing S.E. The lower portion of the range was composed of compact, variegated, crystalline rocks, hard, heavy, and evidently of trap formation; presenting red, white, and black seams, alternating. Above this rock there rested, forming the summit of the hills, a mass of flat, dislocated, stratified rocks, highly crystalline, but of more sombre hue; the lower beds of which seemed horizontal, while the upper were rent and piled disorderly. Upon a closer inspection of this rock I found it presented a laminated structure, composed of thin seams of puce or chocolate coloured rock, of a clayey character, separated by delicate layers of a crystalline substance resembling quartz, and that while the laminae were horizontal, the fracture was vertical, and at an angle of 45° with the surface. I found this rock caused great local magnetic attraction, and that each piece of the stone had two poles, like the loadstone, powerfully attracting and repelling the same point of the magnetic needle. I therefore called this hill Mount Magnet, and fixed its position, by observation, in S. lat. 27° 58', E. long. 118° 37', whence I obtained a view of the country 30 m. around. There was an appearance of wooded hills, with large trees, surrounded by extensive plains, S. by W. about 25 m., and a white quartz hill cropped out on the intervening plain, bearing S.S.W. 7 m. off. To the east-

ward red, scrubby hills, backed by a distant range of low red cliffs, presented an unpromising prospect as far as the eye could reach. I therefore determined to get all my party and horses to the Recruit Flats, crossed yesterday, in s. lat. 28° 15', as quick as possible, and retraced my steps to the camp 50 m. off, where we arrived on the 28th at noon.

I found seven of my strongest horses dead. The other horses that I had left were in a very precarious state. As it was necessary to leave a considerable portion of our equipment behind, under these circumstances, I lightened up about 4 hundred weight, by leaving the pack-saddles, spare bags, painted load-covers and tents, horse-shoes, and such personal comforts as could be dispensed with, without injuring the health of the party, and, loading up immediately, moved the whole of the party and horses, except one which I abandoned in a dying state, to a place I had found 6 m. off *en route* to the Recruit Flats. I found the horses were too weak to carry their loads far, and that I must sacrifice nearly the whole of them if I determined to push on, without resting, to the Recruit Flats, 40 m. distant. I therefore sent out three light parties, on a radius of 15 m., ranging from s.w. to n., in search of grass.

In the evening Charles Farmer and Narryer returned, reporting green grass and water in a thicket 10 m. to the eastward, and the following morning (the 30th Aug.) I sent Mr. Whitfield and six of the party there, with the whole of the horses, excepting two which were left behind without a chance of recovery.

On the 1st September Mr. Whitfield returned to camp, reporting that the horses were in a good place and doing well. I left him with Mr. Fraser and Buck in charge of the camp, and joined the party with the horses, accompanied by two men carrying rations for them. The following morning I left Messrs. Brown, Guerin, Edwards, and Cant in charge of the horses, sent C. Farmer and Souper to the s., and went with Narryer to the s.e. reconnoitering. I travelled about 10 m. on this course, over 4 m. of stony plains, covered with scrub, and 6 m. of hilly country, presenting ironstone and trap rocks densely wooded with acacia. Ascending a hill I saw about 20 m. into the interior, over acacia thickets, studded with low scrubby hills, similar to those seen to the northward, and the loom of salt marshes rose under a range of low scrubby hills that bounded the horizon. I then steered w.a.w. to some promising looking hills that seemed to have been burnt, about 11 m. off, travelling over stony plains, densely wooded, to them. Crossing these plains I saw a new species of parrot—a small green bird with a yellow bar across its breast—and shot two warrungs, a diminutive species of kangaroo, about the size of an opossum. We reached the foot of the hills at 2 h. 30 m. p.m. and saw the track of a native that had just gone to the summit we were steering for. Travelling along his tracks a few yards we found a scoop, or drinking cup, and two clubs, that probably belonged to him. Narryer picked these up and ascended the hill with me. Half-way up the ascent we struck a quartz vein, which I stopped to examine. While stooping, breaking the stones, I heard a native's voice, and, motioning to Narryer to follow, sprung over the wall of quartz and confronted a native, stealthily approaching us about 50 yards higher up the hill, who halted when he was observed, and foiled in his murderous intentions. Narryer spoke to him in the Irwin-River language, telling him we were friendly-disposed and looking for water. He replied in a desperate rage, uttering a few loud words, and shaking his spear at us—but he spoke a language neither of us could understand, though his hostile intentions were sufficiently apparent; and, looking back towards the crest of the hill, he gave the unmistakable double shout twice, as though he thought, since we were so peaceable, it would be quite easy to butcher us: he rushed at Narryer with his spear shipped, to whom I gave the order to fire, just as it quivered, in the act of being thrown. Startled and disconcerted by my voice, and quelled



by Narryer's determined bearing, he turned to fly, and received the charge in his back that was aimed at his breast, with the singularly fortunate distinction for him, that it was No. 4 shot instead of a ball, in consequence of Narryer thinking I said "shot" when I shouted "stop," as he turned, and giving him the lefthand barrel then instead of the right. He uttered a loud yell when he was struck, and bounded over the hill like a stag. Calling Narryer back, who was running after him, and directing him to lead with ball and follow me to the top of the hill, when we reached the summit we found the tracks of two other men and a woman, where they had been crouched up in ambush.

As this man had been so bold, I was apprehensive they had attacked and gained an advantage over some of my party, and marched to the bivouac where the horses were, about 7 m. off, at a rapid pace, cautiously guarding against surprise. Fortunately all had been and was going on well there, and Farmer arrived soon after me, reporting that he had found a spring 10 m. s., around which the natives had built a number of huts last summer, and that the bones of three wild dogs and many small animals were scattered about their fireplaces.

At dawn the following morning I mounted Souper on the best horse, and sent him to Mr. Whitfield, to ascertain how they were at the camp, and directed Mr. Whitfield, by letter, to be vigilant, prepare three days' rations for the road, and send Souper back immediately with a day's rations for my party. I then had the horses looked up, and finding Jailer in a hopeless state from fatigue and poison, left him to his fate, and moved over with them and my party to our bivouac of the 22nd ultimo, 11 m. w.s.w., where we found Souper waiting for us with the rations and Mr. Whitfield's report, stating all was well at the camp. The country traversed to-day was densely scrubby, with patches of dry perished grass, and stony thickets. Three of the horses were very weak, and obliged me to travel very slow, so that it was dark before we reached our destination.

*September 4th.*—This morning I travelled with my party and the horses to the camp to breakfast and load up. I had now 13 horses, 3 of which were unable to carry more than their saddles, but we had so reduced the weight and compass of our baggage, that the 10 available for burthen were enabled to carry all our provisions, ammunition, and stores requisite to efficiently equip us for the march to the Gascoigne River, and 20 days' flour in addition, with which the party could fall back on the Geraldine Mines, in the event of any accident occurring to the vessel that was to await our arrival there with supplies. I therefore announced my intention of proceeding to that point in Shark Bay as speedily as possible, and called the attention of the party to the fact of our being in as good a position as ever we were for the attainment of the important results we had pledged ourselves, under Providence, to achieve, with the exception of having to walk, which we were well able to do, would redound to our credit at the close of the march, and be remembered by those whose good opinion we valued, long after the fatigue was forgotten; that duty and prudence urged us forward—while to retreat, under present circumstances, would involve fatigues and privations no less trying, and a spirit-breaking reception from our friends, whom such faint-hearted conduct would estrange for ever.

As I had made all the necessary arrangements for the distribution of the loads before I joined the horse-party, the horses were loaded up in a few minutes after our arrival, and we resumed our journey, steering s. 4 e. to the Recruit Flats, 40 m. off, where we arrived on the evening of the 5th. Here I halted the party to recruit the horses, and Messrs. Fraser, Brown, Narryer, and Souper accompanied me to make a reconnaissance to the w.s.w., with a view to finding a favourable route to the promising-looking country I had seen from Mount Magnet, 50 m. s.x.w. from our present position, as the

country in a direct line was impracticable. Our course led 3 m. through the open plains around the camp, bounded by hilly, rocky country of granite, trap, ironstone, and quartz formation, covered with loose stones and dense acacia scrub, in which we were entangled two hours while advancing 3 m. farther on, to an open scrubby plain, intersected by salt marshes trending s.w., taking their rise on the s.w. side of Mount Magnet, and about 1500 ft. above the sea. Twelve miles on our course I halted on these plains, and left Messrs. Fraser and Brown to rest, while I proceeded with the natives to search for feed and water, as this was about the distance my horses could travel in a day, the weakest necessarily regulating the pace and journey. We found feed 3 m. s., but could not find any water near it. The promising place in sight was a rocky hill 6 m. s.w. I therefore returned to my companions and informed them of the feed—the probability of there being water at the hill I pointed out 6 m. w., to which I was about to proceed with the natives to ascertain the fact—that in the event of our being successful, I would send back Souper with instructions for Mr. Whitfield to move the party to the grass the first night, and the water the following morning; and wishing them a safe return, I sent them back to the camp, where they arrived late at night. I was much pleased with an incident that occurred on their march, which, though short, was a trying one. Mr. Fraser was wearing a new pair of strong nailed boots, that in travelling over the rocks so galled his feet, that, doing his very best, he fell to the rear. When I halted for him, annoyed at the circumstance, though I felt sorry for him, I saw Mr. Brown taking off his boots, and, apprehensive there was something wrong with him too, I inquired the cause, and he said that “he thought he could walk very well in Fraser’s boots; at any rate he would lend him his and try.” Accordingly the exchange was made, but the new boots soon served Kenneth the same, and I had to halt again while they compromised the matter by each wearing one of the old boots, and wrapping a part of their clothes round the other foot. In this way these young men marched 25 m. through country covered with sharp rocks and high scrub for 16 hours, on the first hot day we experienced, without a drink of water, and, what is far more to their credit, without a murmur.

Sending the two natives out half a mile on each side of me, with orders to march steadily towards the hill to the westward, when I had fired my gun and they had answered it, we crossed the plain searching for water, and found it on the s.w. side of the hill, where we met and bivouacked. The next morning Narryer shot the first specimen of the red kangaroo (*Macropus rufus*), and I carefully preserved it. It was a male, and rather larger than the common kangaroo. Its length, from the root of the tail to the poll of the head, was 5 ft. 3 in., and weight about 140 lbs. Subsequently I saw many much larger. The doe is a very compact, beautiful animal. In addition to the red colour and larger size there are other peculiarities appertaining to this animal which distinguish it from the common species. To a bushman the most important distinctions are its being more fat and better eating. But the zoologist, though doubtless in more appropriate terms, would observe that it was more bullet-headed, and had a Roman nose—that this nose was white, with black spots, in the form of what is called a double snout, and that his ears were as large as a young calf’s, while the lower joint of the hind leg, from the hock to the toe, is much shorter, the foot or toe very short—about 4 in. long in a full-grown animal, and the jump is 18 ft., with the hind legs bowed and the feet so close together that the track resembles the spur of a divided hoof. These animals are not all of them red, some are of a blue or slate colour, with white throats and breasts, and tan marks on each side of the face. I have seen them, both bucks and does, varying thus in colour, herding and feeding together on the leaves of the but or native peach-tree that are very numerous where these kangaroos are found; and two does, differing in colour, as above



described, were killed lying in the shade of the same bush, each with a young male animal in the pouch, similar in size, attached to the mamma, which had yellow silky hair, 3 in. long, growing round them, apparently to keep the young one's nose warm. My two natives, who had never seen one of these animals before, were pleased with their success and the praise I gave them for obtaining this valuable specimen—success, the pleasure of which was enhanced by the prospect of making a hearty breakfast off it, and they assisted me in separating the skin, head, and feet, from the rest of the carcase, but, unfortunately, all the peculiarities that I admired, and have noticed, and which were observed by them on this occasion, induced them to form such an unfavourable opinion of the animal, that they were afraid to eat the meat, though they were very hungry, and this was the first opportunity any of us had had for making a hearty meal for many weeks. When I expostulated with them, pointing out the absurdity of neglecting to strengthen themselves with this meat, Narryer became very excited, and begged me not to propose such a thing to him, “for,” said he, “look at his head—truly it is that of a dog with the ears of a cow. Saw you ever kangaroo so fat, or with meat that smelt so strange? No, sir, this creature is not natural, and it must be a *buwoyer* (magician or evil spirit). Glad am I to be the first of my tribe that has killed one of this odious race! But my father and mother never eat one, neither will I. Let the Northern women eat it if they like, but I must become a great fool before I put any of this strange devil down my throat to give me the stomach-ache.”

There was a high red cliff, about 10 m. N. of our bivouac, that promised water on the summit, and salt feed on the plains at its base. I pointed this out to Souper, telling him I was going there, and Mr. Whitfield was to meet me with the party at that place. I then wrote a letter to Mr. Whitfield, directing him to proceed next day to the grassy flat I pointed out to Mr. Fraser, come here and water the horses the following morning, and push on to meet me at the cliff I have just mentioned, and sent Souper with it, and a piece of the kangaroo, to the camp, where he arrived that night.

Taking Narryer with me, I pushed on over stony plains, covered with scrub, on which red kangaroos were numerous and very wild—so much so that they were startled by a twig breaking a quarter of a mile from them, and started immediately, travelling a mile or so without stopping, jumping very low, and bending more forward than the common species, which their fat heavy tail enables and obliges them to do. Five miles on our course we struck the dry bed of a brook trending to the eastward, and shedding into the marshes at the base of Mount Magnet, flowing to the S.W. As it was late when we started I bivouacked here, and found feed and water in the bed of the stream, where I shot and preserved a parrot, with brilliant green, scarlet, and orange plumage, smaller than the *icterotis*, which Mr. Sanford—to whom I am greatly indebted for his kindness in classifying and preserving my specimens, and affording me an opportunity of referring to his valuable works on Natural History—has called *platycercus*. Travelling over plains of red loam, wooded with acacia, and covered with quartz stones in many places, for about 4 m., we reached the salt-bush plain at the foot of the cliff, and proceeding to the cliff I ascended the summit, and found several small water-holes in the rocks, but not containing sufficient water for the horses that were to be moved here, so I pushed on immediately to another cliff 5 m. S.W. by W., unfortunately with the same result, and halted there. These cliffs were composed of felspar and quartz-crit, capped by stratified quartz and red sandstone, clothed with acacia, while the surrounding plains were scrubby and stony.

The next morning I pushed back to intercept the party, but they had muffled the horse-bells to get near the kangaroos, so I passed them in the thicket and struck the track behind them. Following them up till dark, and renewing the

chase when the moon rose, we came up with them at two o'clock the following morning at the cliff, where they had encamped and the horses found more water, so that there was sufficient for them. All hands were on the alert, and welcomed our arrival with a hearty cheer. When we had breakfasted the day was dawning, and, directing Mr. Whitfield and Edwards to accompany me with two days' rations, I led them to the summit of a cliff 8 m. N., whence the rocky summit of a great wave in the country bore N. by E., apparently 13 m. off, to which I sent them to reconnoitre for water and feed, with instructions to signalize by smoky fires, to show their position, at 4 h. 30 m. P.M. that day, and at 8 A.M. the following morning. I then returned to camp, and posted Mr. Guerin on the cliff to look out. Narryer, though very stanch, was quite knocked up. We had been two days without any other food than half a rat each, being one that he had killed while we were separated hunting for water—devouring his portion immediately, and saving me the largest share, though I had the advantage of him in starting on a good meal of kangaroo. I found the position of this camp S. lat.  $28^{\circ} 00' 45''$ ; E. long.  $118^{\circ} 20'$ ; and 1582 ft. above the level of the sea. In the afternoon I went with my telescope to watch for Mr. Whitfield's signals, but saw none.

The following morning (the 12th), while the horses were collected to start, I sent Mr. Guerin on to the cliff to watch for the signal fires at the appointed time; he saw none, and returned to camp at 10 h. A.M., reporting to that effect. Three of the horses strayed away, and were not brought in till after noon. This, and the uncertainty of feed and water ahead, coupled with the water-holes at the camp being dry, compelled me to send Messrs. Fraser and Brown, with two men and the horses, to the stream-bed six miles back, with orders to turn them out there and bring them back early in the morning. In pursuance of this plan the horses were all in and loaded up early next morning, when we started, steering S. about 5 m. to clear the cliffs and rugged stony ground beyond, and then directing our steps on a course N.N.E. to strike the point to which I had sent Mr. Whitfield, travelling through densely wooded country, on red loam and brown gravelly soil, stony in places, with fragments, 6 inch. cube, of rounded, yellow quartzose rock, with a conchoidal fracture; while the elevated land to which I had sent Mr. Whitfield was of ironstone-gravel formation, and less densely wooded. I halted there, and made casts with the natives to the right and left, firing guns, without seeing or hearing anything of him, and then pushed on about 4 m. further, when we halted, without feed or water, as I did not like going on further without these men, for whom guns were firing during the night. The horses strayed back on the track 4 m., and two of them were reported to have gone right off without hobbles.

While they were tracking up and getting the horses together, I took Farmer and Narryer with me, and proceeded to some cliffs 8 m. to the north of the camp, thinking it probable Mr. Whitfield had gone there and made signals, where they could not be seen, especially as it was the only place that promised water in sight. We saw traces of natives, and several small water-holes, but saw no traces of the men. I then started for a sheet of water or an extensive salt lake, the shore of which was 5 m. N.N.E. from us, trending S.W., and apparently falling to the westward, that might have attracted them, and where we should certainly find their tracks if they had visited the place. On reaching the lake I saw no signs of my men or the water either, as the latter was the delusive effect of refraction on the dry bed of the lake, quaintly termed by Narryer "walk-away and tell-lie water," since it kept receding and still decently luring us on.

I then returned to camp, and, crossing our outward track, observed the natives had been along it with dogs. When we reached the camp Mr. Whitfield and Edwards were just coming in, having been stopping at a water-hole



5 m. E.S.E. Mr. Whitfield reported having only lighted one fire, on the second morning, as a signal, when the smoke spread before it rose above the bushes; this probably caused it to be unobserved; and that he had waited at the water-hole till his provisions were exhausted, when he proceeded to strike the track, picked up Turpin, one of the stray horses, and followed us up. I determined to proceed to the water he had found, with the horses, at once, as there was a patch of grass close to it, and, leaving Buck, Edwards, Cant, and Narryer in charge of the camp, we started over with them. After roaming about in the scrubs four or five hours in the dark without Mr. Whitfield having found the place, I halted the party till dawn next morning, when he knew nothing of his whereabouts, and, as it was becoming serious, I questioned him closely, and was thus enabled to lead him on to the place, when he recognised it, and I found it 3½ m. to the eastward of his course. It was most providential that we did not reach the place in the night, as it was full of poison, and he had not noticed it. Famished as our horses then were, they would have eaten it eagerly, and I should have lost them all. Here I halted two days to rest the horses, herding them during the day, and posting a watch on the poison during the night. Here Mr. Guerin, who was very frank, spoke to me privately of the harassing duty and hard work caused by the horses being too much for him, that he feared he should not be able to hold out much longer, and that he thought we should be better off if we had no horses, and each man carried his own provisions. I have said that he was frank; his quiet statement saved the lives of the party, for when I was thus enlightened, I saw that several other men were under the same fatal delusion, based upon a faint heart and lazy disposition, and I was consequently most watchful and strict to prevent accidents, till they were in a more healthy frame of mind.

I was anxious to recover the other horse that had strayed away, and on the 16th sent Farmer, Narryer, and Souper, with six days' rations, after him, instructing them to persevere three days on his track if necessary, but no longer, and then return, with or without him, as speedily as possible, striking across to a high hill 15 m. N.W., on the north side of which I determined to pass, and halt at the first suitable place near it.

The following day we resumed our journey towards the hill, and travelled 12 m. *en route*, over tolerably level, stony country, wooded like the country before described, halting at some granite rocks, where we found feed but not sufficient water for the horses. Next morning, after traversing 3 m. of level, open acacia plains on red sandy soil, we struck the S.W. extreme of an arm of the great salt lake, over which we passed to the base of the hill to which we had been steering. Here I halted the party, among quartz veins and trap rocks, forming rugged and terrible country for horses, while I ascended the hill to make a reconnaissance. Scrambling over walls of quartz and hornblende schist at the bottom, and over brown mica slate, forming the hill itself, I reached the summit. Here I obtained a commanding view of the great salt lake, extending N. and S. to the verge of the horizon, falling to the N.W. and dry, though there was the same appearance of water that had before misled us. To the S.W. an extensive high range of trap hills, similar to Mount Magnet, rose from the plains, covered with scrub and stones around it, 15 m. off, to which, for distinction, I gave the name of West Mount Magnet. Midway on the plain, and a little more to the southward, red hills and cliffs formed rugged scrubby country, fronted by red sand downs, tolerably open; while 10 m. N., two rounded hills, apparently of the same formation (mica slate) as the hill on which I stood, were connected by a lofty ridge, forming a promontory on the western shore of the lake. Mica slate and trap-hills, blended with quartz veins and hornblende schist, extended 5 m. from the base of this hill towards the N. and W., presenting rugged, scrubby, undulating country, with valleys strewn with the fragments of those rocks. The most promising places for water were

some ravines N.W. 3 m., and some cliffs 4 m. to the westward. I therefore rejoined the party and proceeded with them to the S.W., winding through the rugged country in search of water without success, and debouching upon a level plain of hard, red loam, lightly wooded with acacia, I saw a hill to the westward, for which we steered; and, travelling 7 m. on this course, about 2 m. from the hill we struck the dry bed of a large brook-course, trending to the S.E., and shedding into the great lake.

As several of the horses were knocked up, and some of the loads left a mile back, I halted here to send two of the strongest horses for the loads, while the stragglers were collected, and, sending Messrs. Whitfield, Cant, and Brown down the brook in search of water and feed, I ascended it alone for the same purpose. The brook-bed was deep, on a red sandstone bottom, through which trap and granite cropped in many places. About 2 m. up, another rocky dry bed of a stream, coming from the westward, joined, and there was a grassy flat at the junction surrounded by acacia thickets, covered with large quartz stones. Having found feed, I then struck over the hills to the S. hunting for water. These hills were very rugged, presenting purple, micaceous schist, rising in a dislocated red conglomerate, resting on felspar grit cliffs, in which there were large caves roofed by the red conglomerate that had been recently inhabited by the natives. While examining one of these caves I saw a fly come out of a hole in the side, that the natives had placed a stone over, containing about a quart of water, and this was all I could find.

Returning to the camp, I passed over quartz and iron stones that strewed the plain round these hills, and observed a new shrub or bush about 6 ft. high, with a beautiful flower, consisting of a purple bell drooping from a red and white star-shaped calyx. My friend Mr. Drummond has kindly promised to classify this and other botanical specimens worthy of notice that I have procured.

Mr. Whitfield reported that he had followed the brook down about 2 m., when it spread over a plain with some perished grass on it, and that he had not found any water. Fortunately we had carried some, and I issued a pint to each man for supper, bivouacked there, and led the horses up the brook to the patch of grass I had found. The next morning the horses were scattered and roaming in every direction, searching for water—two of them, which were nearly dying, being the only horses on the flat, and we had great work to get them together; but in doing so, Messrs. Fraser and Cant, whom I took with me to a promising cliff 6 m. S.W., found a spring of water and a beautiful patch of grass. I never saw a man more pleased than Mr. Fraser was on that occasion; he was quite beside himself with joy, and heavily loaded signal guns immediately communicated the cheering intelligence to Messrs. Whitfield and Brown, who had been most indefatigable in tracking up and collecting the horses in this difficult, stony, and scrubby country. Leaving these gentlemen in charge there of the horses they had found, I took Mr. Fraser and Cant over the plain for those we had collected, with instructions to untie two of them and bring them into camp to be loaded with the water-bottles and kegs for a supply of water for the men in charge of the baggage, while I pushed on to them as fast as possible to make the necessary arrangements to prevent delay, as two or three of the horses were dying from weakness and thirst. In passing rapidly through the flat I found one horse down, and another dead; and, hastening to the camp, I procured what we wanted, left Mr. Guerin and Edwards in charge there, and pushed over with the horses to the spring, where we turned them out to feed. I then filled the water-bottles, and loading Postmaster with them, took a supply of water to the men at the camp, and returned to the spring in the evening. This spring was in the sandy bed of a cave, under a felspar and quartz grit cliff, and on the north side of this cave there were perfect representations of seven left hands of natives of the ordinary size,



with one large right hand above and to the left of them; five couples of red kangaroos' feet, and three emus' feet of the natural size—having the appearance of impressions made by these hands and feet previously dipped in some acid fluid that had corroded and discoloured the rock; and several rude imitations of the emus' and kangaroos' feet had been recently carved beneath them, by chipping the rock with a piece of hard stone, probably quartz, as I found a sharp fragment of that rock suited for the purpose in the cave. I called this place the Carved Cave Spring, and found by observations it was in s. lat.  $27^{\circ} 43' 13''$ , E. long.  $118^{\circ}$ .

The following morning, soon after dawn, a native woman and child were seen about a hundred yards from the spring, coming towards it from the southward, and they fled when they saw us there. The child's foot was very small, and they ran off in a s.w. direction. Shortly after this occurrence I moved over with the men and horses to fetch the loads from the camp, and have all together at the spring. I was hurrying on in advance of the party, and near the camp, when one double shot after another announced there was something wrong there; and, in a few minutes after I had answered these signals, Mr. Guerin came running towards me and reported that Charles Farmer had shot himself. I found the poor lad stretched between the loads under the shade of a horse-rug; the horse I had sent him after stood by his side, and the natives, silent and sorrowful, were sitting at his feet. It was a saddening sight, they looked so wan and altered. Farmer's right arm was shattered by a gun-shot wound received above the wrist, and extending along the muscles towards the elbow, where the charge of No. 4 shot had lodged, and apparently injured the joint under the following circumstances, as narrated by himself to me:—

While they were returning with the horse, Narryer, on the 19th, shot a red kangaroo, and Farmer laid his gun down in a bush while he skinned and fastened the hind-quarters on the horse; this done, he laid hold of his gun by the muzzle to throw it over his shoulder, when the hammer caught in a branch, and discharged the contents of the left-hand barrel in his right arm. They had been travelling two days since this occurrence without any other water than the small quantity they were fortunately carrying at the time, which the natives had given him the whole of, though they themselves had been reduced to the utmost extremity by thirst, and the poor horse had been three days without water.

His arm was much swollen, so I washed it with tepid water and put on a large poultice of linseed and oil to reduce the swelling. After I had dressed his arm the poor fellow was very cheerful, said he expected it would soon be well again, and marched quite strong to the spring, where, with great difficulty, I succeeded in getting all the men, horses, and equipment in the evening; but the horses would not feed after they had eaten what little green grass there was on the soaking of the spring, as the dry, dusty grass and salt feed was then distasteful to them, and several of them were so determined in their efforts to get at the green poison-bushes that grew among the rocks, that I was compelled to post a man there to keep them off during the night.

The following morning we resumed our march on a w.s.w. course towards the s. end of a distant high range, extending 10 m. in a s.s.e. direction, with a view to making nothing along its water-shed. Travelling 13 m. over stony plains and acacia thickets on red and brown loam, we halted at dark on a patch of dry grass, though there was no water there, in consequence of Farmer's wound rendering it impossible to push through such a densely wooded country during the night; and two of the horses having sunk under their loads two miles back, I sent Mr. Brown with a horse to bring on their loads, while I pushed ahead three miles, reconnoitring for feed and water.

I saw a promising cliff about 5 m. beyond, on our course, which was cheering

for the morrow, but too far off to move my jaded horses that night; so I kept them tied up till dawn, when we pushed on, leaving two behind in a dying state; but our march was slow and harassing, from four more horses beginning to fail when we started, and finally falling with their loads after travelling about 3 m.; and while I halted the party to unload and get these horses up again, the rest of the horses lay down. I then took the loads off the weak horses, and left them and poor Farmer in charge of Messrs. Whitfield and Guerin, having anticipated and carried bread and water for such an emergency, and pushed on with the horses and the rest of the men, still travelling very slow, to the cliff 3 m. off, which we reached in two hours, and turned the horses out to feed on the salt bush flat at its base, while all but two men, whom I left in charge of the loads, ascended the cliff to search for water. The instant we reached the summit I found a basin containing several gallons on an overhanging rock, and called all the men up to drink before they separated, with strict orders to meet them again in two hours. When we mustered Cant reported having found a hole containing about eight gallons of water on the top of the cliff a mile N.; while I had found a native well about 2 m. S., that I hoped we should obtain water from by opening it, as the ground was moist to the depth of my ramrod. As the horses were feeding I now determined to remain here till sunset, and if in the mean time we could not find feed and water, to push on during the night to the hill, and send Cant to reinforce Mr. Whitfield's party, and inform them of the water-hole he had found. However, that no chance might be lost, especially as I knew that no one was so capable of cheering and getting Farmer round as myself, though Mr. Guerin was very kind and attentive to him, I sent the natives out to examine carefully some broken country I had seen to the southward, and taking Mr. Brown and Edwards with me, opened the well, but as we got down the bottom became more dry, presenting gravel and pipe-clay resting on granite breccia, and indications like many other places visited, where I should have washed for gold had water been procurable, the want of which induced me to consider how much more precious that element was than the metal it thus assists us to discover. Here Mr. Brown shot a fine specimen, the first I had seen, of the crested pigeon of the marshes described by Captain Sturt and a beautiful ground parrot (*pepororus formosus*), both of which I preserved.

At 7 P.M. Narryer and Souper returned, reporting they had found plenty of water in, and a spring among, some granite rocks 4 m. S., that were surrounded by belts of green grass with poison growing in it, and that they had seen two natives on the way constructing a fence in a ravine at the base of a cliff about 2 m. to the westward, to whom they had shouted and made friendly signs to induce them to point out water, but who ran away immediately, and when they were pursued, separated; so that Narryer ran after one and Souper the other. Narryer said he pressed his man so close that he jumped into a thicket and climbed a bush; that while he was there he endeavoured by signs and words to assure him of his friendly disposition and want of water; but the man was so enraged he could not pacify him, and that he threw some filth in his (Narryer's) face and jumped out to attack him, when he (Narryer) fired and the man fell, apparently lifeless. I deeply regretted, and still regret, this occurrence—an occurrence, if blameable, the blame of which attaches to myself for sending these men away; but we were necessarily separated and struggling for our lives; and had blood been shed, or even death ensued on this occasion, instead of the man having, as I have every reason to believe, fallen from the fear of death, since no traces of blood could be found, nor other trace of the man than his firm track leading at a running pace from the spot, I should have found consolation, as I do now, in the reflection that it was unavoidable and fair fighting. Though, to prevent a recurrence of anything of this kind, I severely censured my men for pursuing these natives, and thus provoking



hostilities under circumstances that would have rendered a white man highly culpable; but not without making due allowance for their weaker judgment, and the fact of their having reported the occurrence to me under a firm conviction that they had done their duty.

As it was not safe to travel during the night after this affair, I set the watch an hour a man, and waited till dawn, when I moved with the party to the place Narryer had found, and was very glad to reach such an excellent spot to recruit my horses, which I turned out a short time to feed; and, selecting the strongest, loaded him with water, directing Mr. Brown to proceed, in company with Narryer and Souper, to convey this supply to Mr. Whitfield, to whom I wrote, directing him to send Farmer over with Narryer, Souper, and the horse, and keep Mr. Brown and Guerin there till the morrow, when I would send for them all and the loads. I then had the horses herded on the plains while we cleared the poison off the grass round the rocks and burnt it. In the evening Farmer arrived with the natives, and his arm was looking much better now the swelling was reduced, and suppuration had commenced discharging the shot, eighteen of which were now out. I dressed his arm as before, and gave him a dose of castor oil. We tethered all the horses on the grass we had cleared for them, but several broke away in the night, and fed among, without touching the poison; so, as these horses were more full and doing better than the rest, I turned the others loose and watched them, with the intention of tying them up again if they attempted to eat the poison. Fortunately they ate the grass only; and I subsequently found they never would touch the poison-plant if it were surrounded by other green herbage.

In the morning as arranged, I sent Edwards, with three of the strongest horses, accompanied by Narryer and Souper leading one, loaded with two large water-bottles, instructing them to proceed together to Mr. Whitfield's party.

The following day, I examined all the horses, made good their shoes, and dressed the backs of several—chiefly the withers, which our saddles began to press, now the poor animals were thin. After this, all hands were busily employed repairing boots, except Narryer and Souper, whom I sent out to shoot a mess for Farmer, who at 8 A.M. (26th Sept.) complained of sore-throat, difficulty in swallowing, and pain across his stomach. His arm, however, looked much better, and several more shot came out. I gave him a dose of castor oil at 9 A.M. At noon, stiffness in the jaw alarmed the poor boy, and made him apprehensive that lock-jaw was coming on. This unfortunately was the case; but I told him perhaps he had caught cold, and rubbed his throat with liniment. Towards evening, he could scarcely open his mouth wide enough to admit the point of a spoon. I then bled him, taking a pint of very black blood from his left arm, and gave him ten grains of calomel. During the night he was in great agony, caused by violent pains in his stomach, that made him draw up his limbs, in convulsive fits, on several occasions so hard that he carried away the tent that was over him. I put a large horse blister on his stomach, but in his struggles it was rubbed off before it took effect; so, to give him immediate relief, I applied flannels, dipped in hot water; that he said eased him a little; but, at dawn, I saw there were no hopes of his recovery, and spoke soothingly to him of his approaching dissolution; when he spoke calmly and sensibly to me about his affairs, and added his sufferings were so great, that he was glad to hear that his death was, thank God, about to release him from them. Leaving him to the particular care of Mr. Guerin and Buck, though all the party were anxious and ready during the night to do anything they could to alleviate his sufferings, I directed Mr. Whitfield, in company with Cant and Souper, to proceed with a day and a half's rations, and explore the high hills 10 m. N.W., for our next bivouac, and return the following afternoon; and sent Mr. Brown, with Narryer, to find feed in the neighbourhood, if possible, better than the horses

were in, as I feared, now this place was eaten off, they would soon commence eating the poison. When I returned to Farmer's side, he told me he had four horses and some money—that he wished his brother Thomas to have the horses, and the money to be divided equally between his other brothers and sisters. I wrote a paper to this effect, and read each sentence to him as I wrote it, in the presence of the men, and he approved of what I had written. But, while I was writing the concluding lines, "in witness thereof I have signed my hand," &c., he was seized with violent pains, and became insensible, or rather delirious, calling out for his brother Thomas, till he fainted away. He then lay apparently dead for a few minutes, then rallied—still delirious, and in great agony—for about twenty minutes, when he fainted again, and died at twenty-five minutes past two o'clock on the afternoon of the 27th Sept. As the poor boy could not sign his will, I obtained the signatures of those men to it who were present when he made and approved of it. We then selected a nice spot for his grave on the summit of the hill, close to the camp, shaded by a beautiful drooping wattle-tree, but we reached the solid rock at 2 ft. down, and were obliged to dig it lower down the hill, 20 yards from the left bank of the brook, 80 yards from the spring, and 1896 ft. above the level of the sea, being the highest plain visited, in a lat.  $27^{\circ} 41' 18''$ ,  $\lambda$ . long.  $117^{\circ} 42'$ ; where we buried him at sunset, sewn up in his blanket, with his saddle for a pillow, on to which we lowered him gently in a horse-rug. I read the beautiful service of our Church for the burial of the dead over him, after which we fired our guns, and retired in silence. I never saw men so strangely affected; not a tear was shed, but every man's voice was low and tremulous, and sounded hollow and unearthly all that night.

The following morning Mr. Fraser was attacked with dysentery, and I attributed his illness to anxiety and the desponding frame of mind unfortunately common to all the party, excepting Mr. Brown and Edwards, about this time. I therefore pushed off with the horses and all the men, but Mr. Fraser and Buck, whom I left in charge, with plenty of light work to keep their minds employed, and bivouacked on a nice patch of feed with water, that Mr. Brown found yesterday, 5 m. to the southward, around another patch of granite rocks, the intervening country being very scrubby and stony. In the afternoon Mr. Whitfield and his party returned to camp; where I arrived the next morning with Mr. Guerin, whom I sent back to the horse-party with a day's rations, and orders for them to bring the horses into camp next morning. Mr. Whitfield reported that he had found water and grass 16 m. s.w., on the w. side of the high hills to which I had sent him, and that I subsequently called Mount Farmer. After breakfast we carried some stones from the adjacent granite rocks, and placed them round and over poor Farmer's grave, with a slab at his head, on which, with a chisel and tomahawk, I carved "C. Farmer, 1854."

I then examined our stores and weighed all the provisions, namely, 568 lbs. of flour, 24 lbs. of pork, 12½ lbs. of sugar, 20½ lbs. of tea, and 16 lbs. of tobacco; equal to 50 days' rations of flour, 5 of pork, 44 of tea, 5 of sugar, and 85 of tobacco, after issuing to the 1st October inclusive. Joker, a fine young horse, died from fatigue that morning, and Sinbad, Mr. Whitfield's horse, was so weak as to be unable to carry a load. Having only 11 other horses, several of which were very weak, it was necessary to dispense with all we possibly could to reduce our baggage, and consequently I set aside the spare saddlery, the boxes in which specimens were stowed, all the geological specimens that I could correctly describe, and 20 lbs. of powder—burying the latter at the foot of Farmer's grave, and stowing all the specimens in the apparatus for evaporating salt water. We then arranged the loads in proportion to the relative strength of the horses, and towards evening we had everything in readiness to put on their backs. Soon after dawn the next morning (30th), the horses



were brought in, and we resumed our journey from Farmer's grave towards the hills I had named after him, steering S.S.W., through acacia thickets, on yellow sandy land, covered with ironstone gravel, to a granite hill 10 m. distant, situated between the southern range, Mount Charles, and the more elevated northern hills of Mount Farmer. I ascended this granite hill, which was dislocated and wooded, and as the party wound round the N. side, halted them, and called up Mr. Whitfield and Souper, to point out the place they had found, that I might get the bearing and distance, to prevent the spot being missed, in the event of our being benighted. Marching thence on the same course, over plains covered with ironstone, densely wooded, and intersected by several dry streamlet beds trending towards the W., from the W. side of the Mount, after travelling 2 m., we struck a patch of granite rocks, with more than sufficient water on them for our horses, whence, while watering, Souper saw the place we were steering for, about 4 m. off. As the horses, after this timely refreshment, were able to reach the feed before dark, and I was particularly anxious to obtain a round of angles from the summit of Mount Farmer, I sent Mr. Whitfield on with the party, instructing him to tie up the horses till I joined him, and then pushed off to the top of the hill, where I arrived a few minutes only before sunset, and obtained a view of the surrounding country that amply compensated for the hard run Narryer and myself had to reach it in time for my work. From N., round by S., to S.W. on a radius of 20 m., the country presented stony plains, covered with scrub, studded with trap hills to the westward, and granite rocks from N. to S.W., like the bold hills on the Dale River, and bounded on the S.E. by the western shore of the great salt lake, in which a distant blue peak loomed like a granite hill, apparently 40 m. distant, bearing S.S.E. or in a line with the Mount Farmer range, extending about 3 m. in that direction, from the summit, which is about the centre of this group of hills, and 350 ft. high. Here I observed great local magnetic attraction in the trap rock of which these hills are composed, which is a close-grained green and white rock—green predominating, like clink stone, with a conchoidal fracture. The country that intervened between Mount Farmer and the camp, 5 m. W.N.W., presented a rocky thicket, covered with sharp quartz and ironstone round the foot of the hills, changing to brown gravelly and sandy soil, wooded with acacia, extending to the granite rocks, where I found my party bivouacked at 8 P.M. on a nice patch of grass, 1726 ft. above the sea.

October 1st.—The next morning we steered W.S.W., and marched 5 m. over stony plains, wooded with acacia and studded with small granite rocks, when we encountered a patch of densely wooded ironstone country, from the summit of which I saw a large bare granite hill, bearing S.W. by W. apparently 12 m. off, to which, as the intervening country was more favourable, I proceeded, over red loamy land, affording better travelling than I anticipated, and presenting acacia and salt bush plains drained by watercourses, then dry, trending S.W., and that had cut down to the red sandstone rock which formed the substratum of these plains. The base of the granite hill was very rugged and stony, but we found a patch of grass and a fine water-hole on the S.E. side, where we encamped for the night. Among the huge blocks of granite on the eastern side, the "moursarungs" or rock kangaroos were very numerous, and several of these animals were shot. On the plains to the westward, many red kangaroos were seen, but they were very wild, and we could not get near enough to them for a sure shot, though several were badly wounded. Here also we shot several "bodgegarag" or shell parrots (*melospitta undulatus*), and four small finches resembling, but smaller than Java sparrows. After this date, the latter birds were always found at the water-holes, and frequently by their chirping attracted us to water, that but for them would have been passed unnoticed when the men and horses were suffering from thirst. From the

summit of this hill I observed a peaked hill apparently 35 m. off, looming blue and smoky like granite, and the country *en route* s.w.  $\frac{1}{4}$  n. looked more promising, as bare granite rocks jutted out on the intervening plains, and the sandstones had been swept off a vast area, over which not a cliff could be seen in that direction.

Travelling towards this peak next day, to a granite rock 10 m. *en route*, we passed through 4 m. of rugged country, presenting conical hills of quartz and ironstone, rising to the height of 200 ft. from plains strewed with mica, hornblende, and quartz schist, and wooded with acacia, whence we emerged on open acacia and salt bush plains, extending to our bivouac in s. lat.  $27^{\circ} 15' 23''$ , s. long.  $117^{\circ} 10'$ . Here I was rather anxious about my two natives whom I had sent to shoot kangaroos, as we were getting short of meat, with instructions to work till the close of the day if they were unsuccessful, and then join us in the evening, and who were absent all night, in consequence of my speaking very positively to them under the impression that a superstitious feeling had deterred them from killing these animals since poor Farmer's accident.

We made a short journey of 7 m. the next day to a group of bare granite hills to the westward, travelling over 5 m. of undulating rocky country and then entering a plain intersected by two dry brook courses, on which some natives had recently bivouacked, and the bed of a river, 110 yards wide, trending to the northward, with a sharp gravelly bottom in the channels and sand hummocks between them, on which clumps of black wattles were growing luxuriantly. Narryer and Scoper joined us in the afternoon, reporting that the river we had just crossed flowed into another 8 m. n., that came from the s.e. and was trending s.w.; and that they had found a spring 2 m. n. of our last bivouac, where the natives had constructed an ambush so as to lay hold of the emus' and kangaroos' legs when they were watering. They also mentioned a curious mark on a bare granite rock, consisting of four large stones laid in the form of a cross around the base of a vertical stone like a boundary mark. The following morning (4th Oct.) we resumed our march, steering s. by w. towards the distant peak. The country for 4 m. presented granite hills and rocky valleys wooded with acacia, and affording a little green grass round the rocks. We then entered a level, open country covered with angular quartz stones, extending 2 m. on our course, and terminating in a belt of sandy loam stretching along the left bank of the river Narryer had described, and that we struck after travelling about 8 m. and crossing three dry brook courses falling into it. This river bed was dry, 70 yards wide from bank to bank, with small sharp quartz and granite gravel in channels, 30 ft. deep, trending s.w. and apparently falling into the Murchison, as a belt of casuarina trees fringed its tortuous course on the plains towards that river. A small and beautiful painted quail rose from the stony plain, and several crested pigeons were flushed in the acacia scrub on the sandy land; while from the many tracks of emus and kangaroos, these animals must have been very numerous. Crossing this river and travelling on the same course over granite country, wooded with acacia and presenting undulating brown gravelly land for about 8 m., we struck another dry bed of a river trending s.w., the same breadth and 21 ft. deep, cut through the red sandstone to the granite rocks that formed a waterfall with three springs at the base where we struck it, and encamped in s. lat.  $27^{\circ} 2' 45''$ , s. long.  $116^{\circ} 58'$ , 1884 ft. above the sea.

We found the traces of a large body of natives having bivouacked here about three months before us, and feasted on kangaroos. Their fires were ranged in a circle, about a bundle of grass like a wheat-sheaf, that they had left behind. The springs were bushed round, and pits sunk within the enclosures, in which they had secreted themselves to spear animals when they



drank at the springs. This was the first place at which I had seen any indications of a large number of natives having been collected during the last three years, and I thought it encouraging, especially as the country ahead was improving. I named this river the "Sanford," after, and in compliment to W. H. Sanford, Esq., our respected Colonial Secretary, and pushed on to the peak next morning, over 6 m. of undulating granite country.

Halting the party at the base of the peak, I selected Mr. Guérin to accompany me and ascended to the summit of this bare granite rock 240 ft. above the plain, whence I could see many miles—at least 40—in every direction. I named this hill Mount Luke, after my friend Mr. Luke Leake, of Perth. It was surrounded apparently by a vast wooded plain, studded with bare granite hills and bounded on the s.w. by a high range about 50 m. distant, the summit of which bore s.w. by s.; but when I descended and advanced with the party towards this high range, I found the intervening country for many miles very rocky and uneven, and intersected by several brooks, trending to the westward, with grassy banks and beds. The country was so much better than we had been traversing before, though still very indifferent, that we obtained grass and water every night, and 25 m. on our course, in s. lat.  $26^{\circ} 38'$ , E. long.  $116^{\circ} 40'$ , 1199 ft. above the sea, we crossed three large and deep river-beds, perfectly dry, trending s.w., and spreading over plains tributary to the Murchison. There were white gum-trees growing along the banks of these rivers, the first we had seen since leaving Toodyay, and many of them of a large size.

On the 8th we encamped on the w. side of the high range for which we had been steering, in s. lat.  $26^{\circ} 24' 58''$ , E. long.  $116^{\circ} 28'$ , in the plain intervening between the base of the range and the Murchison River. We halted here a day, and called the highest summit of the range Mount Murchison, which is about 400 ft. above the plain, and of greenstone trap formation, with a conchoidal fracture, while granite rocks crop out round the base of the range, and the sides of the hills are strewn with quartz stones. Resuming our march on the 10th, and travelling 3 m. on a s.w.  $\frac{1}{4}$  s. course, over a plain 1069 ft. above the sea, we struck the Murchison River, trending w.s.w., the bed of which was dry, 64 yards wide from bank to bank, with a main channel 36 yards wide, cut down 33 ft. through the red sandstone rock, with coarse yellow sand in the bed, on which several patches of samphire and rushes were growing. White gum-trees of a large size, looking very healthy, grew along the margin of the river, and stunted trees of the same description were growing for half a mile on each side, on clayey flats subject to flood, and covered with small nodules of limestone.

Five miles beyond the river, we entered a patch of rocky country, presenting red sandstone cliffs, and conical hills of greenstone trap, through which we passed on to a white plain, covered with quartz stones, and studded with red and white hills, presenting small peaks of felspar and red sandstone. From the highest of these peaks I obtained an extensive view. To the eastward the country presented red sandstone cliffs and scrub for at least 30 m.; and on each side of a group of trap hills, 10 m. to the s.e., which I called Mount Narryer, the country was very rugged, much dislocated, and very densely wooded. I therefore held my course over undulating, broken country, strewn with iron-stone, quartz, and gneiss stones, and wooded with acacia, for about 10 m. further, when I saw a white cliff, that promised well, bearing s.w. by w., apparently 20 m. distant, for which I steered, travelling over densely wooded, stony country, rising towards it, and where we arrived at 10h. A.M. on the 12th of October, in lat.  $26^{\circ} 7'$ , long.  $116^{\circ} 58'$ .

The cliff we struck was the highest, and composed of white sandstone with quartz pebbles imbedded, surrounded by a broad belt of gneiss stones, along the eastern edge of which, a watershed without a channel, wooded with white

gum-trees, and strewed with nodules of limestone, trended to the southward. Another long cliff extending to the s.w., composed of white rock like chalk, with quartz pebbles imbedded, was surrounded by gneiss and quartz stones, on undulating scrubby country. A little in advance, and trending s.e., a range of gneiss hills, much dislocated, presented rocky scrubby country, destitute of water, and intersected by two ridges of pale greenish white rock, the one having angular pieces of quartz about  $1\frac{1}{2}$  in. cube imbedded, and the other round pebbles about the same size, both seams having the appearance of congealed concrete. There was no water here, and this was the third day my horses had been without water. The country to the s., s.w., and w., was gently undulating, scrubby, and most unpromising. The only place in sight that promised even a chance of water was a group of table hills 25 m. s.; but my horses were too jaded to push on over the rocky country that intervened; however, there was no time to lose, so I determined to retreat to a native well 12 m. back, where the water came in at the rate of three gallons an hour, draw that well steadily, and open another. Accordingly we returned to the well, and were up all night watering the horses. At dawn we commenced sinking another well, but struck rock everywhere at about seven feet; so, seeing there was no chance of obtaining more water, I determined to draw the old well steadily till midnight, and then travel during the night towards the table cliffs 25 m. s.w. from here. At noon I sent Mr. Whitfield and Souper on in advance, with instructions to explore around the cliff for water, and to be prepared to lead us to it when we arrived there with the horses, and thus save time, as I knew the horses would be greatly distressed.

About 2 A.M. on the 14th we resumed our march, and the horses travelled very well till dawn, when we entered a dense thicket of acacia and eucalypti, on loose, yellow sand—the worst piece of country we had yet encountered, extending 12 m. on our course. The sun shone out with peculiar brightness and intense heat—the glare was intolerable; one horse fell to the rear, and I directed Cant, who was leading him, to let the old horse take his time, and sent Narryer back to keep him company. About noon we struck a patch of broken, undulating land, covered with quartz and gneiss rocks, and much more open, about half-way; whence a large smoke, that Mr. Whitfield had made in advance, could be seen. In about two hours I was near the smoke, and fired a signal gun, which was answered by Mr. Whitfield; and the party pushed on with revived spirits. As we approached the smoke could be distinctly seen, rising from beneath a large green tree, so healthy-looking, that we fully expected to find a fine spring there; but, to my great surprise, Mr. Whitfield reported there was no water, and that he had been waiting under this tree since nine o'clock in the morning, as it was so hot that he was afraid to push on to the cliff and execute his orders. I was annoyed, but said nothing to show it; and told Mr. Whitfield, as it was now cool, he could resume his march, and that it was of the utmost importance his orders relative to the cliff should be executed. There was only one man in advance when I came up with Mr. Whitfield, and seeing the effect the disappointment had on him, I determined to push on, if possible, without its being communicated to the rest of the party.

After travelling about 3 m. through a rocky thicket, I saw the fresh track of a native. I knew on such a day he would not travel far without water. The country was so stony it was some time before I found another foot-print—night was coming on—four more horses were down, and when I halted the rest to prevent their running over the track, several rooked to and fro, and sunk under their loads. I had the loads taken off those horses; and, having taken the direction the native's tracks led, we pushed on again, and, just as the sun went down, I struck a path which, providentially, led me to a beautiful well of water, in a bare ironstone plain, that no one would ever have expected



to find water on. Had we missed this well, not a horse would have been saved. Mr. Whitfield came in a few minutes afterwards, without having visited the cliff, apparently perfectly ignorant of the importance of the duty I had intrusted to him, and prostrated by anxiety.

Although we had every reason to rejoice and be thankful for this timely supply of water, I felt anxious about the two men that were absent with the four horses that had been left behind between three and six miles. These horses belonged to Messrs. Guérin and Fraser; so I selected those gentlemen to accompany me at dawn next morning, carrying some bread and water for the men, and to endeavour to save the horses. About 2 m. from the camp we met Cant and Narryer coming in, driving one. They were more cut up than I expected to find them, especially Cant, who had taken fright at seeing the loads scattered about on the track, and who reported that one horse was down 8 m. back, and that the other horses that we were going after had strayed from the camp. I sent Cant into camp with one, and gave him great credit for getting the old horse on so far. Narryer volunteered, after he had eaten a small piece of dry bread and drunk about a quart of water, to accompany me after the horses. We spent the whole of the day tracking them up, and driving them towards the camp, but they all fell about 2 m. from it, and died there, after all our trouble.

The next day I sent Messrs. Brown and Whitfield, with Edwards and Cant, to feed the horses at the flat, with orders to return with them the next afternoon. I then started with Narryer and Souper, searching for feed and water round the cliff to the s.w. I found the cliff was of gneiss formation, of great extent, forming a rocky table-land, and surrounded by dislocated red and yellow hard sandstones, in fine slabs. Among these rocks Souper and myself fired at, and missed, two moderate-sized black kangaroos. We saw several fresh tracks of natives, but could not find either feed or water anywhere about these rocks.

At dawn the following morning I took Messrs. Fraser and Guérin, and Narryer and Souper, out with me towards the s.e., and found a patch of feed about 5 m. from the camp, in that direction, and sent Messrs. Fraser and Guérin back with instructions for Mr. Whitfield to move the party and horses on there, after they were brought back in the afternoon. I then pushed off to some granite rocks to the eastward, where I found a spring and a small patch of good feed about 8 m. from the last place I had instructed Mr. Whitfield to move to, and I now sent Souper with a note to him, directing him to bring the party here next day, and await further orders. There were many traces of the natives having recently visited this place. At one fireplace I found a large broken univalve shell, and on the flat top of a large granite rock there were some rude carvings representing either a boat or a fish and a harpoon. For distinction, I called this place the Broken Shell Spring. The following morning, Narryer accompanied me towards a high, bare granite hill, 23 m. s.e. Before the sun rose we had shot two red kangaroos, and left them with our water-bottle in the fork of a bush, to which we intended to return to supper.

After travelling 10 m. over tolerably open country, covered with quartz stones in many places, we struck the Murchison River, trending w., and 115 yards wide, at its junction with another dry stream-bed coming from the s.w. The river here was very bold, in one channel 30 ft. deep, with a bare gravelly and coarse sharp sandy bottom, cut through the red sandstone that underlaid the stony table-land on both sides, which, like the banks higher up, appeared to be subject to occasional rushing floods. Descending the river in search of fresh water, we found several large, shallow pools of brine, surrounded by a sheet of salt several inches in thickness in many places, though in most it was about an inch thick. We traced a native into and along the

bed of the river about a mile, when he struck off towards some broken country about 5 m. to the southward. We spent several hours in an unsuccessful search for fresh water. Though we dug in the most promising places we invariably obtained salt water about 4 ft. down. We saw the tracks of red kangaroos and emus where they had been drinking or bathing in a pool as salt as brine, and subsequently saw some brilliant parrots water there. There were two of these birds, male and female I imagine, as one was brilliant scarlet on the breast and neck, and dark green on the back and wings; while the other was a beautiful rose colour on the breast and neck, and pale green on the wings; and they came and went in company. Thinking it probable that the man whose tracks we had seen was travelling to some watering-place, I struck off towards the rocks, 5 m. s., and reached there late at night. The following morning we explored every place likely to afford water, but could not find any. Another roasting day was before us, and we had not tasted water or food since we left the Broken-Shell Spring. But the feed certainly and possibly the water also was exhausted there by this time, while there was every probability of there being both feed and water at the granite hill, which now bore *s.* 10 m. distant. To it therefore we went over undulating scrubby country and through open salt-bush plains, tributary to the Murchison, and arrived there an hour after noon. Here we found water and grass, and shot a rock kangaroo for breakfast. While we were resting a fine emu came to the water-hole, but saw us and ran off before we could get a shot at him. Tired as Narryer was, he bounded after this bird in an instant, bow in hand, and was stealthily approaching almost within shot, when another bird, that he had not observed, caught sight of him and gave the alarm to its mate, with whom it fled into the scrubs.

I saw with pleasure that my horses would gain strength at this place, and called the hill "Mount Welcome." Knowing they were starving, we started back at sunset, and reached the Broken-Shell Spring at dawn next morning, after marching hard all night. I found Mr. Whitfield with the party there all correct, cheered them with the news of the good place we had found, and sent them off there immediately, detaining Mr. Guerin to guard Narryer and myself while we slept, and accompany us to join the party during the night. But myriads of small black flies rendered sleep impossible. I determined to lie quiet and get used to them; however, I could not stand them; and when at last I opened my mouth to denounce them, a cloud of the little wretches charged down my throat and nearly choked me. Fortunately they retired at sunset, when we slept a few hours, and thus refreshed, pushed on early the next morning to join the party at Mount Welcome, where I found all well, at 2 p.m. on the 21st October, in *s.* lat.  $26^{\circ} 44' 23''$ , *E.* long.  $116^{\circ} 24'$ . I halted here till the 25th, and sent Mr. Whitfield out with a party to explore the broken country through which, under any circumstances, I determined to push to the westward, to facilitate our progress. While we were encamped here the weather was hot and sultry, with light airs from the *s.w.*, very cloudy, threatening a thunderstorm every day, till towards night, when the wind veered to the westward and the sky became clear till about 2 a.m., when a heavy bank came up from the *s.w.* and soon spread in dense cumulus above us, but so low that the granite hills that studded the plains attracted fleecy clouds from the mass that produced a beautiful effect at sunset. My barometer was unfortunately injured by the horse falling over a cliff with it in his load, on the 14th, when it received a severe shake, and the observations taken with it here are only of value as showing a rise of  $0.8$  every evening when the cloudy canopy was dissipated.

The mean temperature for this period was—8 a.m.,  $89^{\circ}$ ; 10 a.m.,  $104^{\circ}$ ; noon,  $109^{\circ}$ ; 2 p.m.,  $116^{\circ}$ ; 6 p.m.,  $103^{\circ}$ ; 8 p.m.,  $91^{\circ}$ , in the shade of a blanket under a shady bush. The direct heat was, of course, more intense, probably  $120^{\circ}$  at noon.



At 4 P.M. on the 22nd Smuggler fell backwards into the well, and so injured himself that he died on the 24th. On the 23rd I examined and weighed all our provisions, and issued rations for all hands up to the 28th inclusive. There was a balance of 222 lbs. flour only, so I reduced the ration from 1 lb. 2 oz. to 1 lb. per day, which, for the ten of us, gave 22 days' supply—or up to 19th November—there being a loss or excess of consumption on unavoidable occasions of 30 lbs. since we left Mount Farmer.

On the 24th, Messrs. Fraser and Brown, accompanied by Souper, whom I had sent out the previous day with Mr. Whitfield, returned to camp, reporting that they had found water 14 m. w. by s., and a patch of good feed 4 m. south of it, and that Mr. Whitfield would meet me at the water on the evening of the 25th, as directed. The following morning (25th) we resumed our march towards the Gascoigne, and travelled over open plains, shedding the waters of the rivers we had crossed to the eastward into the Murchison, for about 10 m., when we entered the rugged country of sandstone, gneiss, and other schistose rocks, mingled with quartz and ironstone, and densely wooded, round my bivouac of the 18th, through which we pushed to the granite rock that afforded the water-hole they had found. Here we halted, and after the horses were watered and the men had dined, I sent them to the feed 4 m. south, with orders to return here and pick up their loads early in the morning. Mr. Whitfield, with Edwards and Narryer, returned the next morning, reporting that the country he had traversed for about 12 m. to the westward was rugged and destitute of water and feed, and that he had not seen any place that would sustain our horses for a night, while the Murchison River, where he crossed it, 7 m. to the westward, presented a bold bed, saturated with salt water, for a mile or two to the right and left of his track.

Soon after Messrs. K. Brown, Guerin, Cant, and Souper came in with the horses, looking well, and an old native they had found near the Grass Mount, and who had pointed out a fine spring about half a mile south of the feed. The old man was very thin, and eagerly devoured what food we gave him. Unfortunately, we were very hard up, and could not spare much. As Mr. Whitfield and his party were very tired and had suffered a great deal from thirst, so much so that Edwards gave up and Narryer had to carry water 10 m. for him, and Mr. Whitfield, who stayed with him, before they had the courage to travel, I determined to move the party down to Grass Mount, and water at the hole the native had pointed out, and which, on our arrival, we called the Captive Spring, in compliment to the poor old fellow whom I detained when he wished to leave.

The next day (27th) we resumed our journey, taking the old man with us, and steering N.W. by W. for the south end of the cliffs, and the scrubby undulating country that crippled us on the 12th. For 8 m. our course led over tolerably open acacia plains, on which Narryer shot a fine red kangaroo. We then crossed the bed of the Murchison, trending south, and divided into two large channels, half a mile apart, in a salt-bush flat 3 m. wide, covered with nodules of limestone, and apparently flooded at times, while the margins of the channels were fringed with she-oak and white gum-trees, similar to those before described. Beyond the river the country became very stony, with gneiss and quartz, in angular blocks, about 5 inches square, and densely wooded with acacia.

Travelling about 9 m. over this wretched country, we succeeded in reaching a water-hole, under a cliff, with a small patch of grass near it, that was surrounded by a dense thicket, which we should never have thought of penetrating but for the old man who led us through it.\* Here, in s. lat. 26° 40' 13", e. long. 115° 50', I was obliged to watch the old man very narrowly to prevent

\* Three specimens of a small rose-coloured cockatoo, with slate-coloured body, about the size of a pigeon, were shot and preserved here.

his escape, as I took charge of him till after Aldebaran came on the meridian, and the old fellow was very troublesome. I assured him we were only going a few days' journey to the westward, and that we would bring him back to his own country again and set him at liberty. But as the language of each was unintelligible to the other, I did this by signs; and, at two o'clock next morning, called Mr. Guerin to watch him till dawn, when we started again, steering s.w. through undulating yellow sand-hills, covered with dense acacia scrub, separated by rocky, ironstone, and gneiss plains, tolerably open, but still terribly hard for both men and horses, as the stones were so loose and large we could not obtain a firm footing.

After travelling about 12 m. over this kind of country, we struck a samphire flat, at the foot of some rugged hills that stretched across our course. As it was an awkward place to face with weak and jaded horses, I halted a few minutes to breathe them, and questioned the old man about the water ahead. He pointed to the south-west, and gave me to understand there was plenty of water and grass in that direction, but none on the course I was steering, and that the natives never travelled through the country I wanted to traverse, but always went either to the south of it, or the north, where there was a great river and plenty to eat and drink. His great wish appeared to be to lead us back towards the Champion Bay country. He was becoming sulky when I questioned him further, so I determined to hold my course and trust in Providence, keeping a sharp look-out for water. The country was the worst we had travelled for loose stones and rugged hills, but we nevertheless accomplished 13 miles more, and reached a ravine of brown micaceous, primary slate presenting huge flights of steps and extensive platforms, exceedingly difficult for the horses to descend. I had to grope my way through this frightful place in the dark, as it was so confined and difficult, that the night closed over us before we could extricate ourselves. Repeatedly the horses took leaps and passed places that the party deemed impracticable. I was pledged for the performance, and it was a most exciting scene. Not a horse was hurt, and we reached a patch of feed at the bottom, where the brook, that occasionally dashes over these rocks and must then present a fine sight, had formed a fine flat. Here we encamped, and spent a great part of the night searching for water, but without success. The old man depended upon finding water in the ravine, and was greatly disappointed when we failed to procure a supply there.

29th October.—At dawn next morning we recommenced our march on the same course, and travelled through a narrow valley, bounded by mica slate-hills on the right, and quartz grit and felspar cliffs on our left, for about 3 m.—the horses forming the centre of the party, which was distributed over the country for 3 m. in search of water, and advancing towards a promising cliff, en route at the head of the valley. We all met again there, where we could not find water, and every man reported he had been equally unsuccessful. There was a long range of high cliffs in sight, bearing w.n.w., apparently 12 m. distant, that presented a deep indentation, likely to afford water and feed, so I determined to proceed there, and, descending from the cliff, we crossed a plain 3 m. wide, covered with samphire and salt bush, and shedding s.w.; after which we entered a dense thicket of acacia, covered with quartz and ironstones, like a newly metalled road, over which we marched about 10 m. to the gorge in the cliffs, where we arrived at 10 A.M., and I halted the party to reconnoitre.

The day was very hot, and the men and horses looked very jaded. The old man scratched a hole under a bush and lay down like a dog, overpowered by heat and thirst. When I roused him, to ascertain if he knew where there was water in these cliffs, he laid hold of my arm and pointed up the gorge, but seemed doubtful. However, I pushed off in that direction immediately, with Souper and Buck, and explored every nook to the head of the valley. We



found several large water-holes, perfectly dry, and one with some moist sand on the top, near to which some natives had recently bivouacked. We opened the latter without any benefit; but I found it was taking too much out of me working without water under a broiling sun, and, at 3 P.M., returned to the party, whom I found buried, like the old native, in holes they had scratched in the sand under bushes that they had thrown the horse-rings and blankets over. The horses, too, were so thirsty they would not feed, and were standing alongside the men, with their heads under the blankets. The thermometer was then  $111^{\circ}30'$  in the shade.

The old man looked up anxiously when I arrived, and wept bitterly when I told him that the water-holes were dry. He evidently despaired of his life, and his apprehensions were speedily communicated to many of the party, as I saw by their anxious faces. Every man's eyes were fixed inquiringly on mine, and it was evident they knew the importance of the next move. I had formed my plan, but I was so oppressed by a perception of the consequences, that, though anxious to relieve my companions from suspense, several minutes were passed in silence before I could tell them that we were beat, and that I intended to retreat to our last watering-place, 40 m. S.E., subsequently called the Retreat Well, and to start at sunset.

We were now in S. lat.  $26^{\circ}15'$ , E. long.  $115^{\circ}10'$ , or about 50 m. from Shark Bay, and 100 m. from the mouth of the Gascoigne River; and the country for 30 m. towards either was densely wooded, and falling to the westward, without a trace of any water-shed. I assured them that, under Providence, there was every probability of our reaching the Geraldine Mines in safety, even though every horse were lost; that fortunately I saw my way very clearly, and felt satisfied that every man, who steadily obeyed my orders, would see his friends again; but that, at the same time, we must be prepared to endure great privations, which every horse we could save would diminish. All were very cheerful after this, though their sufferings were great, and drove them to extreme measures to allay their thirst. When the sun went down we took off our shirts, loaded the horses, and marched through the night stripped to our boots and trousers, to get the benefit of the dew. I sent Narryer and Souper on ahead, with instructions to keep the track, make haste to the well, and return along the track to meet us with a keg of water. Near our bivouac of the 28th I made a détour to the northward, to avoid the rocky ravine, and at dawn I found we were entangled in gneiss and mica slate-hills, nearly as bad as the country I was avoiding. Soon after this our course was arrested by the rocky table-land we were traversing terminating in a perpendicular cliff, 90 ft. high, extending as far as I could see to the right and left, and facing our old track, 3 m. south of it. I saw no loaded horse could pass this place, and determined to unload, leave the baggage here, mount the men on the horses, and push on to the well, to save the lives of both. When I halted them, both men and horses rocked as they stood, and I was afraid we should have some accidents in descending the cliff. I ordered each man to unload the horse he led, mount him, and come on with his arms and ammunition. Messrs. Whitfield and Guerin had each lost their horses this morning, and consequently had to walk. I gave Chainer Cant, who rode my horse, a bag of flour to take charge of, and Buck half a bag. Then, as the old man had been hanging on me all night, and said he knew of no water nearer than that we were steering for, I gave him a blue shirt, shook hands with him, and intimated that he was free either to follow us and share what we had, or leave us. The effect of this intelligence was wonderful. The crouching feeble creature, whom I had supported all night, believing that, if we passed near water, he would be obliged to discover it, was up in an instant, standing erect and proudly on the edge of the cliff, where, with laughing devilry flashing in his eyes, and his right arm extended towards the west, he blew like a grampus in the direction of our track.

I found a better place than I expected to descend to the plain, but we had not proceeded far when I saw that Cant was giving up and we should lose his horse, so I took the flour away from him and gave it to Edwards. Mr. Whitfield then lay down under a small bush and said he could not go any further. I tried to rouse him, but failed in my endeavours; and then directing the party to follow in one track, so that we might be easily followed, I pushed on to the track, and placed some bushes across it to mark the spot for night-work.

About an hour after we struck the track, I found Narryer and Souper buried under a bush, and the empty keg lying in the pad. They said they were very sorry that they had not done what I told them, and that they would follow up in the afternoon. I told them not to fear, and to come on at once if they were able. Narryer then crawled out and pushed on about 6 m. farther, when he gave up again. The horses began to fall when the sun got power, and fell to the rear one by one, till, at the close of the day, when I reached the well, I was only within hail of Mr. Brown; but, as I had brought the keg on with me, I then felt that I was in a position to save them all.

At 8 p.m. they were all safe, excepting Messrs. Whitfield, Cant, and Guerin, after whom I started at dawn next morning, with Edwards and two horses. Just as we started I heard a gun, apparently about 2 m. off on the track, and, as the horses travelled very slow, I called out Mr. Fraser, and sent him on fast with some water. In a few minutes we came up with poor Guerin, sadly altered and nearly gone, supported by Mr. Fraser. He had no gun, and I therefore knew that one of the other men was near, so, directing Fraser to get Guerin in as soon as possible, I pushed on, firing signal guns in answer to those ahead, about 5 m., when I found Mr. Whitfield and Cant sitting on the track, under the shade of a small bush, and nearly done. We stayed about two hours with them, and freshened them up with flour and water till they were sufficiently recovered to travel, when we mounted them on the horses, and I gave Mr. Whitfield instructions to proceed to camp and send Messrs. Fraser and Brown to meet me here next day with some water. I then went on to the loads, accompanied by Edwards, to hide the flour and procure a few things that would place us in a better position, and diminish our risk in the event of anything occurring to prevent our recovering the baggage. Unfortunately the sleeve full of water that we intended to carry had been left with Mr. Guerin, and we were thus left without water for two days, marching back with a load. Edwards behaved remarkably well on this occasion. We reached the cliff at night, and went over the loads at dawn next morning, procured what we wanted, found three horses dead, and returned to camp that night, escorted over the last 6 m. by the gentlemen I directed to meet us with some bread and water.

When I arrived, Mr. Whitfield reported that the water-hole was nearly dry. I inspected it, and saw we had not a moment to lose. I sent Mr. Whitfield, Buck, Narryer, and Souper off immediately with the horses for the loads, and, at dawn next morning, sent Messrs. Fraser, Brown, Guerin, and Cant to the Captive Well, with orders to halt there and await further orders if there was water; and, in the event of its being dry, to push on to Mount Welcome and wait there till I joined them, taking care to screen all the water-holes from the sun. I directed Mr. Fraser to kill a horse, if he failed, near the river, and salt him down, as he was on his last legs and could not be of further use.

November 2nd.—This day Edwards and myself were resting at the Retreat Well, while the rest of the party were moving as I have described. We examined the country along the s.w. side of the great gneiss cliffs, and found several water-holes dry that had been visited by a large body of natives that were encamped there about three months before us. There were an immense number of their fire-places, with acacia-pods around them, and the stony slopes were full of holes made by them in digging up some root they eat, and that



must be very plentiful and a favourite food, as the surrounding thicket is intersected by numerous well-beaten paths. At midnight the horses arrived with their loads all correct, but as I had only a gallon of water for each of them, I turned them out three hours to feed till dawn, when I gave them the water, and we pushed on towards Mount Welcome. Leaving them to proceed along the track, I struck off with Souper, and found a fine water-hole in another patch of ironstone table-land. Signal guns were fired immediately, as agreed upon, and, in a couple of hours, the horses had as much water as they could drink, and were grazing in a tolerable patch of feed about half a mile south of the well, which was half-way between the Retreat Well and the Murchison, and 2 m. south of the track. I sent Souper off immediately to place a mark on the track where we turned off, for Mr. Whitfield's guidance, who was behind with Narryer and did not come in till the afternoon, in consequence of having to go back 2 m. beyond the loads, to fetch my haversack with the watches and some valuable memoranda that I had given him to take care of, and that he laid down and left behind when the horse fell. I then sent Souper with a day's rations for Mr. Fraser's party, and orders for them to join me immediately, in pursuance of which they came in the following morning.

Mr. Fraser reported that the horse died on the 3rd, at Grass Mount, and that the meat was too inflamed for food. Here we halted a clear day to refresh the horses, and I deemed it advisable to reduce the ration to  $\frac{1}{4}$  lb. of bread per day.

On the 5th November we resumed our march, and proceeded all together towards the Captive Spring, for about 3 m., when I sent Mr. Whitfield on there with the party, and taking Narryer and two days' rations, steered s.s.w., over tolerably open stony country, and struck the Murchison about 15 m. lower down, where it presented a bold bed, and we could not find either fresh water or feed, though we worked at every likely place for 6 m. down the river till noon the next day, when Narryer was nearly done, and I thought I should lose my faithful and generous companion. However, he rallied after I washed him with brine; and marched quite strong to the Captive's Well, where we joined the party, after midnight, and found all correct.

The next day we all proceeded to Mount Welcome, and bivouacked a night and day there. Just as we were about to start again, the well failed before all the horses were watered, and had we not most fortunately filled the water-bottles and kegs in the morning, we should have been in a most critical position. But fortune never deserted us. We had been striving hard to win our way through a most formidable country, and Providence so ordered the course of events, that we were repeatedly extricated from perilous positions by means, in semblance trifling, though really miraculous.

On the 8th I examined and weighed the provisions, and finding we had only 81 lbs. of flour and  $2\frac{1}{2}$  lbs. of tea, while we had 160 m. to march before we could reach the Geraldine Mines, and 90 m. to strike Mr. Gregory's last watering-place on the Murchison, through a country so densely wooded and destitute of water, that he had been deterred from penetrating it, I determined to reduce the ration to  $\frac{1}{4}$  lb. per day, so as to make it last for twelve days, or till the 20th of November, when I expected to arrive at the mines. I then buried 9 lbs. of powder, the shoeing tools, and four tomahawks, under a bush 18 yds. E. from the base of a deep indent on the s.e. side of the mount. At midnight we left Mount Welcome with water for three days, steering S.W. towards Mr. Gregory's last on the Murchison, where, with great difficulty, by long night and day marches, we arrived on the 12th, and encamped on a beautiful patch of grass on the bed of a stream that we obtained water in by digging, 4 m. E.N.E. from the great bend of the river, and in s. lat.  $27^{\circ} 40' 13''$ , E. long.  $115^{\circ} 50'$ . Our course between Mount Welcome and this place led across extensive plains, over which the waters of the rivers we had crossed to the eastward flow to the Murchison, and through places

covered with quartz and iron stones, wooded with acacia and studded with granite breccia, greenstone, and mica-slate hills, that in many places presented rugged barriers impeding our progress without affording either feed or water, and only furnishing a sufficient supply for our horses once, at a large hole on an elevated granite platform on the n.w. side of a huge bare rock of that description, in s. lat.  $27^{\circ} 38'$ , e. long.  $115^{\circ} 48'$ .

On the 14th we resumed our march down the Murchison, in which, below the great bend, or the point where the waters from the eastward are concentrated and fall into it, we found plenty of fresh water, either in small springs under the red sandstone cliffs that bound the bed on either side, or by digging in the sand hummocks accumulated in the bed. Twenty miles along the river, from the great bend, we found a few pools of salt water, and shot a few brown ducks on them; and in the thickets on both sides, presenting stony plains and wooded with acacia and white gum-trees,  $\frac{1}{2}$  m. back, several turkeys and red kangaroos were shot and many emus were seen. Lower down, the fresh water and grass were scarce for 30 m., and the country presented a barrier, destitute of large game, that appeared never to have been visited by them. Low ranges of hills that, till this time, had been 7 or 8 m. off on both sides, now closed upon the river, and made the passages down it difficult by continually driving us into or across the heavy sandy bed, and presenting dense scrubs that prevented our cutting off the bends. The prevailing rocks on these hills were sienitic trap and gneiss, and spurs or dikes of the former rock cut across the river-bed in several places. After I had verified our position by Mr. Gregory's marks, I found his sketch of the river of the utmost service, for, knowing his accuracy, I was enabled by it to save many miles and strike his water-points even in the dark; and I have much pleasure in admitting that I was mainly able to penetrate beyond him, through the valuable information he afforded me and the friendly interest he took in the Expedition.

From the traces of Mr. Gregory's party in the bed of this river, and other satisfactory evidence, I am convinced there has not been a sufficient fall of rain in the interior during the last three years to cause either it or its tributaries to flow.

We met a party of natives about 30 m. from the mines, and they, thinking we were going up the river, gave me a very truthful account of the country, advising us all that it was destitute of fresh water, and no men could live there at this season.

On the 19th, at noon, we were within 15 m. of the mines, and finished our provisions, intending to get in that night; but, at sunset, Narryer shot a fine emu, about 4 m. from the mines, in a fine patch of grass, and, as the horses were weary, I halted there for the night and pushed on to the mines next morning, where we arrived in health and spirits, though looking thin and jaded, at 11 a.m. on Monday, the 20th November, and where we were received and treated most kindly by Mr. C. Evans and Captain Hoskens, to whom I shall always feel grateful for their unremitting attention to my party, as soon after we arrived there all of us were ill, except Mr. Brown, and I was down the first night, though I had been very abstemious.

On the 22nd, I sent R. Buck, J. Edwards, W. Cant, Narryer, and Souper, with the horses and equipment, in a cart to Port Gregory, in charge of Mr. Whitfield.

On the 24th, Captain Sanford galloped in with a lot of fine horses, mounted the rest of the party, invited us all to Linton, and volunteered to take me up in his cutter to Shark Bay, to relieve the ship and push, if possible, from the mouth of the Gascoigne to my last bivouac in the interior. The pleasure this offer afforded me can scarcely be conceived. I determined to take Narryer with me, and eagerly embraced it. It was such a noble and manly offer, and



so calculated to be of service to me—especially as he well knew the risk, having nearly perished in his former bold attempt along the coast with Mr. Gregory—that, though circumstances ultimately prevented my accepting it, I thank him from my heart. We accepted his kind invitation, and leaving our good friends at the mines, proceeded on the 25th to Port Gregory, where I had the pleasure of meeting on that day, and consulting with you relative to the disposal of my party, and when it was arranged that Messrs. Bock, Edwards, and Cant should accompany you in the schooner 'Daphne' to Fremantle; that Messrs. Whitfield, Fraser, Brown, and Guerin should be, as they requested, immediately released from their engagements; and that Narryer and Souper were to proceed overland with me to Head Quarters, as soon as the horses were sufficiently recruited. In pursuance of this arrangement, I arrived at Perth on the 27th December, and reported myself to you, when I was glad to learn that all my party had safely arrived before me.

Looking at the map of the country I have traversed you will see, 1st.—That there are extensive marshes in  $118^{\circ}$  E. long., between  $27^{\circ}$  and  $28^{\circ}$  of S. lat., flowing and trending S.W., and about 1400 ft. above the level of the sea; that the country between Toodyay, which is about 800 ft., and the base of Mount Farmer, on the S.W. side of these marshes, rises gradually to the height of 1896 ft. above the sea; and that this portion of the country is so inclined, that the water is shed over this area, towards the S. and W., into Mr. Gregory's great lake "Moore," which is tributary to lake Cow-cowing, flowing thence, by way of the Salt River and the Avon, to the ocean.

2nd.—That there are four large rivers in  $117^{\circ}$  E. long. (between  $27^{\circ}$  20' and  $28^{\circ}$  40' S. lat.) of a decidedly fresh character, coming from the N.E., and shedding into the Murchison, which, itself, flows from the same direction; and that I appear to have struck near the S.W. extreme of its basin; that large numbers of natives occasionally come down these streams at the latter end of our dry season; and that red kangaroos, emus, and turkeys were very numerous between these rivers, though the country on our route was very indifferent, and still worse to the westward, while, everywhere else, the country traversed was destitute of game, and afforded no traces of any number of natives, except at the eastern side of the cliffs near "Farmer's Horse Camp."

3rd.—That, between Mount Farmer and Mount Magnet, 150 m. to the eastward of Mr. Gregory's last bivouac on the Murchison, and 300 m. S.E. from Shark Bay, I have passed over 70 m. of undulating country, presenting chocolate-coloured mica-slate hills, and felspar and quartz grit cliffs, in association with quartz and hornblende schist, resting on granite breccia and greenstone, surrounded by plains of red loam, covered with quartz stones and rich black iron ore, and shedding to the S.E. into the great interior marsh I have discovered flowing to the S.W.; that 100 m. N. from the bottom of Hamelin Harbour, or the S. arm of Shark Bay, at the place we retreated from on the 12th of October, there are white cliffs resembling chalk, and quartz grit cliffs, with egg-shaped quartz pebbles of various sizes imbedded in them, resting on dislocated gneiss rocks, intersected by two walls or veins, one of round and the other of angular quartz stones, cemented in a hard greenish-white matrix, and surrounded by red loamy plains, covered with these angular and rounded stones; that 100 m. S.S.W. from this last-named place, and on the left bank of the Murchison, across my track of the 15th and 16th of November, there are similar pebble cliffs in association or blended with primary schists; that there are pipeclay plains, resting on greenstone, around the quartz schist ranges, in the vicinity of Mount Kenneth, and similar plains, covered with quartz stones, at the base of the Felspar Cliffs, near our bivouac of the 12th of August; and that all the facts I have alluded to under this head

show the accuracy of Sir Roderick Murchison's views relative to the geological formation of the country to the eastward of the Murchison River and at the back of Shark Bay.

I beg to direct your attention to the first and second items, as indicative of a fertile country to the eastward; and to the latter as confirmatory evidence in support of an eminent geologist's opinion that we have, in this hitherto unexplored and imprudently neglected portion of our territory, probably one of the finest Gold Fields in the world. I have noted many important facts in support of these opinions, which, if you wish me to lay before you, I shall have much pleasure in submitting for your further consideration, as well as a plan for future operations from a central depot on the great bend of the Murchison. In conclusion, I thank you for the consideration and kindness with which you have supported and guided me in this arduous undertaking; and I beg to assure you that I regret that an Expedition, for which I was so efficiently equipped, and on which, subject to proper restrictions, I was left as free to act as I could possibly have desired, has not resulted in immediate benefit, to satisfy those who are not capable of appreciating the importance and ultimate utility of such explorations.

I have much pleasure in bearing testimony to the obedience and general good conduct of my party.

To Mr. George Phillips, of the Colonial Secretary's office, we are all indebted for his having volunteered and taken charge of the schooner 'Perseverance,' sent to meet us at the mouth of the Gascoigne, and I have to thank him for the judicious and spirited steps he took there with that vessel, which I am satisfied were admirably calculated to ensure our communicating with him, had we been so fortunate as to reach that place. Nor am I forgetful of the privations the officers and crew of the vessel cheerfully endured to serve us, and for which I do, and we all ought, to thank them.

## APPENDIX.

### 1. Letter from Mr. George Phillips to the Hon. the Surveyor-General.

Western Australia, Perth, July 6, 1855.

SIR,—In compliance with your request, I have the honour to inform you, with reference to the River Gascoigne falling into the N. arm of Shark Bay, after perusing my Journal, kept while engaged carrying out your instructions relative to furnishing supplies for, and communicating with the exploring party, under the command of Assistant-Surveyor Robert Austin, that this river flows into Shark Bay by two branches, about 2½ m. apart, forming an island, called Raddage Island. The approaches to these branches are obstructed by sand spits. The entrance, in the north branch is about 12 yards wide, with a depth of 4 ft. water at high tide. When once in, it has the appearance of an estuary, being of considerable width, say 500 yards, running inland N.E. about a mile, when it takes a sharp turn to the southward. Point Whitmore, to the north of this entrance, described by Captain Grey as being a drift sand, has, since then, been washed into the northern entrance, thereby contracting it, and lessening the depth of water on the bar. There is but little drift-wood on the banks of this branch of the river.

The southern branch is of a very different appearance. After crossing the bar, which, at low water, is perfectly dry, and, during flood-tide, has from 5 to 6 ft. water over it, you immediately come into a fine sheet of water, about 376 yards wide, and 2½ fathoms deep. Up this branch we pulled 1½ m., the river still carrying its width with it, but not depth. This branch had every appearance of being the outlet of very heavy falls of water. The banks to the south were thickly covered with driftwood, some of the logs being of considerable dimensions, and a



great quantity of it mahogany (*eucalyptus robustus*),\* which, from my slight experience in these matters, I believe is indicative of a well-timbered country at the back. The banks of the river are composed of porous red sand, among clay; and the flats, which extend to the south, are salt marshes.

The bar, at the entrance, is, I imagine, from its shape, formed of a deposit from the freshes during the floods. On it there is a considerable quantity of driftwood, some of which is so placed as to resemble a number of posts, when viewing it from seaward.

That portion of Babbage Island presented to the sea is formed of abrupt white sand dunes. At the back of these dunes, it appears to be luxuriantly vegetated, and intersected by mangrove creeks. The island is easily recognised, it being the most southern part of the coast where the sand dunes exist in that portion of the bay, the southern branch of the river separating it from the belt of mangrove-trees.

The country to the south of the river, and on the coast side of the range of sand hills, so far as I had an opportunity of observing, is of a very sterile nature. It consists of salt marshes, clay flats, sand, and scrub; no timber of any description, and covered with natives' paths, well beaten, and in places, artificially raised above the level of the swamps.

With regard to the natives, the majority were well-proportioned and fine athletic men; they do not seem to make use of any paint whatever, are of a dirty black colour, do not wear any clothing, and I never at any time saw them accompanied by women or children. They were always armed with short, barbed spears, and throwing-sticks, and always seemed anxious for us to go to them; but on our doing so, retreated to the shore or into the scrub, where they would commence hallooing one to another until the sounds were lost in the distance. They never evinced any hostility to us, save on one occasion, when three of the men left the boat to visit the bottle I had buried, containing intelligence of our arrival, for Mr. Austin, on the south end of Babbage Island; when returning to us they were chased by nine natives armed with spears. Upon the men regaining the boat, we fired a shot over their heads which checked their further pursuit. They then made signs of peace to us by throwing down the spears behind them and holding up their hands to show that they were empty, but they were not to be trusted. I observed upon one occasion, when returning to the vessel from the river, that they used a description of net which appeared, as near as I could form an idea at the distance we were from them, to be about 20 ft. in length and 3 ft. deep; this was drawn across the channels, like a seine, by two men, and the fish driven by others into it.

We were very fortunate in securing a good anchorage, 5 m. to the south of the river, in a channel in a very extensive sand flat. This flat stretched over an extent of 15 m. north and south—ran out into the sea between 4 and 5 m., was intersected by deep channels, with bar entrances. The one in which the schooner was anchored had 8 ft. of water on the bar, 2½ fathoms inside, and about 100 yards wide. In this novel harbour we remained in perfect safety, 3 m. off shore, and in smooth water, although exposed to the full force of the wind. On each side of the channel at low water the flat was perfectly dry.

It is exceedingly difficult to discover the approaches to any one of these channels in gloomy weather owing to the flat being covered with weed at its outer edge, but on a clear day these openings are very distinct, and you are enabled to follow the channel with the eye until it shoals to a mere ditch.

There is a very large channel to the south-and-by-east of the river, and at the northern extremity of the sand flat, with upwards of 7 ft. water at the entrance to it at low ebb tide, and about 200 yards wide, with upwards of 3 fathoms water. The only disadvantage attending this channel, is that it is open to the north-west gales; and it would be necessary to proceed some distance up it to avoid the sea.

It would always be desirable, in the event of any vessel seeking shelter in any one of these channels, to lay down buoys on each side of the entrance, and send a boat a short distance in advance up the channel, when with proper management a vessel could be safely taken in without fear of grounding.

\* It is believed that this is the most northern point on which this species of *eucalyptus* has been seen.

The wind, during our stay, varied from S.E. to S.S.W., with clear sky. When at S.E. it invariably blew a gale, which caused fine red sand to blow from the main, giving the appearance of a red haze. Upon one occasion, when it had been blowing stiffly from the east, the rigging was covered with a fine red dust. With the wind from the S.S.E., we had very cloudy, gloomy weather, intensely hot, and accompanied by severe thunder-storms. On December 17 we had the only shower of rain worthy of notice; during the time the shower lasted it was exceedingly close.

The rise and fall of the tide varies from 5 to 6 ft. at the full of the moon, when we had the highest water, and low ebb tides at the season of the new moon.

The only curiosities I was fortunate enough to discover, were some water-snakes, of green and yellow colour, about 6 ft. long, but which I was unable to preserve, not having the proper materials,—and part of a canoe, picked up on the southern extremity of Babbage Island, similar to that found by Mr. Austin when surveying that coast in 1851.\*

The following, Sir, is a brief outline of my proceedings from the time of my leaving Fremantle to that of my return to head-quarters:—

Sailed from Fremantle on the 11th October, 1854, with a light wind from the S.E. Arrived at Port Gregory on the 15th; and after taking in our supply of water we sailed again for Shark Bay on the 18th—anchored at the Quoin on the 20th. We then formed a Provision Depot, as a resource for the boats, in the event of an accident occurring to the vessel while off the river. Sailed at daylight on the morning of the 25th for the N. end of Peron's Peninsula, and anchored there at 4 P.M. on the same day. We again sailed in the morning and sighted the main about 9h. 30m. A.M.,—stood in close for the land. I then went in search of the river without succeeding in finding it. While searching for the river I came upon an extensive flat with from 2 to 3 ft. of water on it. It was intersected at intervals with deep channels, varying from 2 to 3 fathoms in depth, with bar entrances. After pulling up and down the coast for several hours I returned to the ship, when it began to blow very strongly from the S.W. We were, therefore, obliged to stand out to sea once more. On the night of the 29th, the wind having fallen, we stood in again for Shark Bay, having been blown about 60 m. outside of Bernier Island. On the 31st went in through the Naturalist Passage, and at 7 P.M. let go anchor for the night on a pearl bank, about 3 m. to leeward of Peron's Peninsula. On the following morning we worked up to the north extremity of the Peninsula, where we remained till the 5th November, taking in a supply of firewood.

\* The canoe presented to the Perth Museum by Lieut. Helpman and Mr. Austin, on their return from the survey of Shark Bay and Exmouth Gulf, in 1851, was found by the latter gentleman on the sandy mangrove point on the southern side of the S. entrance of the Gascoigne River, and consisted of a very light log of white wood, 11 ft. long, and 10 in. diameter, curved at one end to an angle of 100°, with pegs driven on each side of the curved end, on which two layers of small twigs were bound with bark, forming a basket like a dish along half its length, in which the natives probably place their spears, children, &c., while propelling themselves across the river; but as these canoes, which are not adapted for rough water, were found among the drift timber, at a point where the river is fordable in fine weather, and the materials of which they are formed do not grow on the coast, Mr. Austin infers they came from the interior with the drift timber, from a good country lying in a N.E. direction, within 200 m. of the coast, abutting its waters S.W., into the upper part of the S. arm of Shark Bay by this river, and another supposed to exist between it and Cape Cuvier, and abreast of Bernier Island, on which Captain (now Sir George) Grey discovered a great quantity of large drift timber; and N.W. into Exmouth Gulf, where Mr. Austin discovered extensive mud-flats, containing fragments of granite, slate, and quartz, indicative of the mouth of a large river that flowed from a country where these rocks prevailed, more especially as the neighbourhood of the coast appears of coalitic and tertiary formation. In addition to what I have advanced here, and elsewhere, in favour of a large river flowing into Shark Bay, it may be useful to state that the singular pinnatifid animal called the Dugong, an inhabitant of shallow seas near the mouths of large rivers in S. America, was found by Lieut. Helpman there, and accurately described for the information of Professor Owen, of London, by myself.—ROBERT AUSTIN.



At 2 A.M. on the morning of the 6th we again sailed for the main, with a light southerly wind. At noon we anchored the vessel in one of the channels before mentioned. After the vessel was safely moored I started once more in search of the river, the south entrance of which we made at dusk, and found it as before described. While running up the coast this afternoon we fell in with several sea-snakes of a dingy brown colour, with bright green and yellow spots. We slept at the southern extremity of the island on the night of the 6th. In the morning, so soon as it was sufficiently daylight, I went and examined the mangrove bushes, to see if any limbs had been cut off, also whether any of the earth had been turned up about them, but found no signs of the party. We then returned to the vessel.

On the 14th I visited the north entrance of the river for the purpose of ascertaining the depth of water and the formation of that branch. We found the entrance very narrow and about 4 ft. deep; this was at high water. It had a sand-bar in front, on which, with an ordinary sea breeze, the sea broke with violence.

During my absence on the 6th the vessel was visited by seven natives without exciting any fear, as I was afterwards informed by the master, and which I found to be the case on several subsequent occasions.

On the 22nd the vessel was moored in another channel with less water, and with barely 4 ft. water on the bar at the entrance, at ebb tide. In this channel we remained till the 60 days had expired, and continued to visit the river twice a week. On one occasion of visiting the river we found the remains of a ship's long boat about a quarter of a mile to the s. of the river.

Native fires were very numerous along the coast during the whole period we were in this vicinity.

On the 7th January, 1855, the number of days we were to remain in the vicinity of the Gascoigne having expired, and not having seen any signs of the Exploring Party, we took advantage of the fine weather, and after warping the vessel out of the channel set sail for the Peninsula; the wind favouring us a little, we arrived at the north end of the Peninsula on the 8th, took in a supply of water, and sailed for the Quoin on the 12th, where, after breaking up the Provision Depot and ballasting the vessel with guano, we sailed for Port Gregory, at which port we arrived on the 27th, and having learnt the safe return of Mr. Austin and party, we sailed for Fremantle on the 30th, and arrived there on the 4th February, and on the 5th I proceeded to head-quarters and reported the safe return of the schooner from Shark Bay.

## 2. Letter from Mr. Drummond.

Hawthornden Farm, April 16, 1855.

SIR,—I have examined the two collections of plants brought and sent home by you, as well as I can, from the very imperfect state of the specimens. I find, in all, about fifty exogenous plants, three endogens, and one acrogen, or lichen. The leguminous plants are ten in number. The plant which was pointed out to me by my son James, as the one which poisoned your horses, is a species of *gastrolobium*, the same genus which is known to produce so many poisons; it is in flower in the first collection, and in seed in the second. One of the most beautiful plants you brought home is of this order—a plant with flat, leafless stems, and large red or yellow flowers. I found it, first, near the Waagan hills, and, afterwards, saw it in many places in the Champion Bay district. Although I have long sent it to Europe, I have, as yet, seen no description of it. I observe six myrtaceous plants in the collections: one, a gray shrub, with branches densely crowded with leaves, is new to me; but it has neither flowers nor seed-vessels. Among the myrtaceae, there are specimens of *salix pulchella*, and *callistemon phoeniceus*, of Lindley, both beautiful Swan River plants. There are five or six proteaceae, none of them new, and an equal number of composites, all common everlasting flowers. The collection contains a pretty *hibiscus*, with grey, wrinkled, selenum leaves, and a hoary-leaved purple flower. I have gathered both of these plants in the Champion Bay district; both collections contain specimens of a very beautiful plant, the *hexandria velutina* of Steetz, a plant first found in this colony by Mr. Roe, and, I believe, sent by him to Baron Hügel. The second collection contains fragments, almost in the form of powder, of two *bracteaceae*

plants. These make our Western Australian specimens of this curious parasitical genus amount to eleven in number. If you can recollect them, it would be well to state the trees on which these parasites grow. When at Champion Bay, I found a curious climbing blue-flowered pentandrous plant, a new genus, natural order unknown to me. Your second collection contains two additional specimens of this unknown genus. The same collection contains two remarkable plants, which are altogether unknown to me. Of one, there is only a very small fragment, the top of a shoot with very clammy leaves. This plant I cannot examine without altogether destroying the specimen; and I think it better to return it to Mr. Roe as I received it. The other plant has grey leaves, and remarkably oblong shield-like seed-vessels. I know no plant which in the least resembles this, and, without much better specimens, I cannot understand its economy. Of the endogens, two are very common all over the west coast. The third has no leaves, but, from the flowers, it seems to be a pretty, new species of *thysanotus*. The *aerogen* is a curious lichen, allied to the European *L. caninus*.

### 3. Letter from W. A. Sanford to the Colonial Secretary.

Perth, July 7, 1855.

SIR,—As you request, I send you a list of the mammalia and birds, the skins of which you have forwarded me, as far as I am acquainted with them, with a few observations on the distribution of the species.

*Ophoraster rufus*.—Great red kangaroo. *Lagorchestes hirsutus*.—Rufous hare kangaroo. *Hypodotis Mitchellii*.—Mitchell's soft-ear. *Echidna hystrix*.—Spiny echidna.

From your description, you appear to have fallen in with large numbers of the *Hypodotis conditor*, the building soft-ear, and *Charopus castaneus*, the chestnut-eared hog's-foot, and some of the *Onychogalea lunata*, innated nail-tailed kangaroo or worung.

*Stria delicatula*.—Delicate owl. . . . . Another species. *Cinclaoma cinnamomeum*.—Cinnamon ground-thrush. *Coccyzus ros.*.—Rose-breasted cockatoo. *Melospitta undulatus*.—Undulated grass parakeet or buljirigar. *Euphonia Bourkei*.—Bourke's grass parakeet.

*Platycercus*. . . . . Probably a new species—small, not so large as *P. scleroticus*; blue, green, with a delicate brown bar on the tip of each feather on the neck and back; base of the tail black, shaded through green and blue to white; primaries black, outer rib blue shaded into white; secondaries deep blue; under wing coverts and scapulars bright blue; belly and vent pale greenish orange, frontal band orange, and spots of orange brown on rump, shoulders, and top of the head. Killed on the Upper Marchison.

*Pezoporus formosus*.—Beautiful ground parrot. *Cochophaps plumifera*.—Crested pigeon. *Estrilda bellii*?—A small finch. *Carpodacus*?—I am not acquainted with this courser, but have no reason to believe it new.

Four small insectorial birds, with which I am not acquainted.

You also appear to have fallen in with considerable numbers of the *gnow*, *leipna ocellata*, and many other birds well known in the colony.

Your description and sketch of the nest of the *gnow* is most interesting, and is probably new to naturalists, as far as the detail is concerned.

The conclusions which may be drawn from the existence of many of the above animals in the colony are, that a country of a somewhat similar character to that in which they were found exists, extending from it to the borders of New South Wales.

The *Ophoraster rufus* has not hitherto been found to the west of South Australia, except when seen by Mr. Gregory and my brother, in their last Expedition; and your having brought home specimens sets the question at rest as to the existence of the species in this colony. The fact of the variation of colour in both sexes from blue to red is a fact, as far as I know of, hitherto unnoticed.

As these animals require good feeding ground, their existence in this colony affords some hope that a communication may yet be found between this and the Eastern Colonies.



The *Hypselotis* of both kinds, the *Charopus*, and *Echidna* have been found in the Eastern Colonies, and, with the exception of the *Echidna*, in much the same sort of country as that in which you appear to have found them.

The *Lagorchestes* and *Onychogalea* have hitherto been found in this colony alone.

Of the birds, the most interesting, in point of distribution, are probably *Cinclopus cinnamomeus*, a bird of considerable rarity, found only in the remote interior. Another species inhabits this colony, and another New South Wales. *Cacatus* *cus*, *Melopsittacus undulatus*, *Euphonia Bowkii*: these are all characteristic of the interior; this *Euphonia*, I believe, has never been found near the coast.

The *Cursorius* indicates the probable existence of vast flat countries. The only parts where such birds are at all plentiful, as far as I am aware of, are in the neighbourhood of the Sahara, and similar localities.

The birds, as well as the mammalia, lead to the conclusion that you reached the central region of animal life of this continent; and that a country capable of supporting large animals exists throughout the interior, although probably separated into oases of greater or less extent and distance from each other. The spot where the great red kangaroo was most abundant would, on this view, be the best adapted for a starting-point for any fresh Expedition into the interior.

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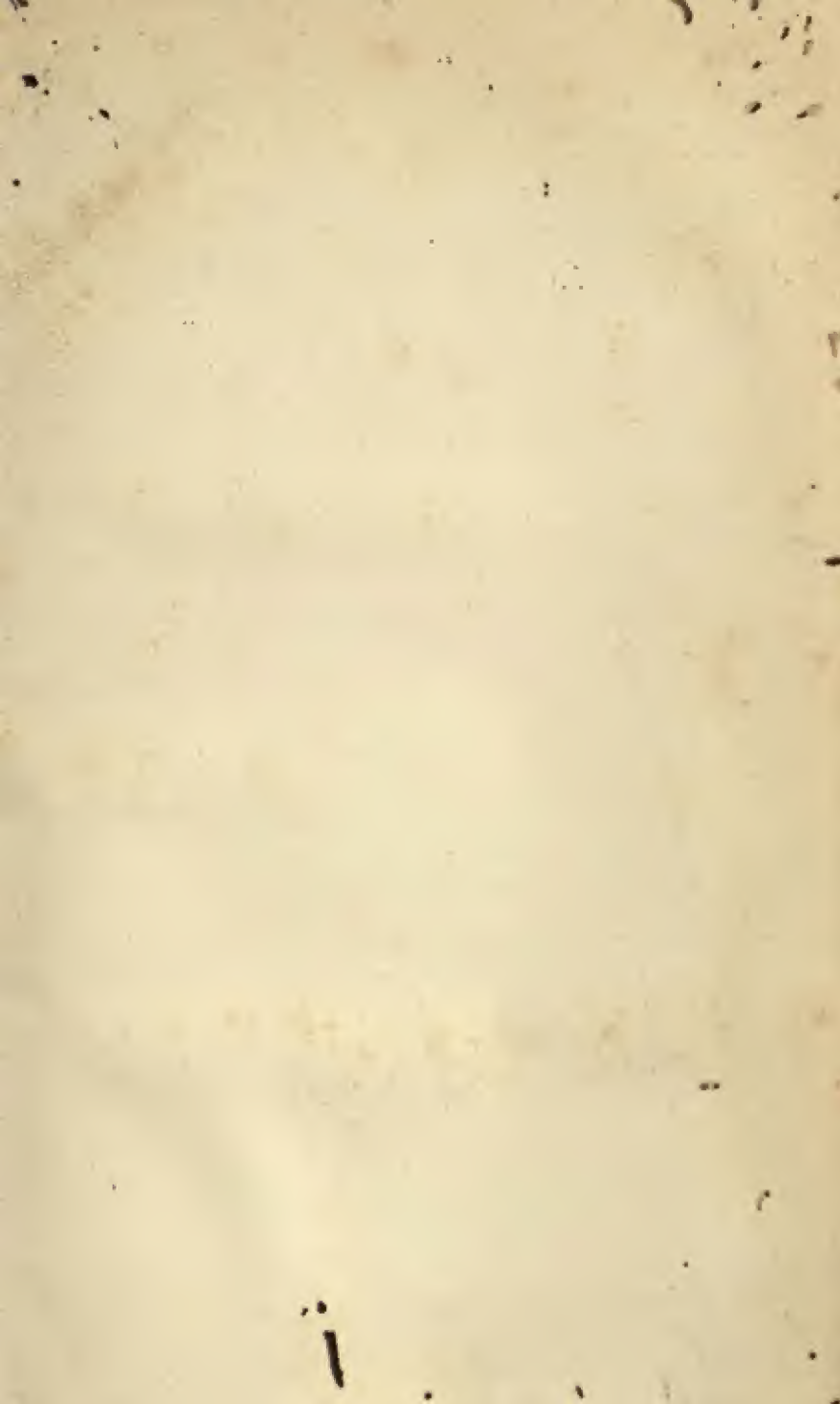
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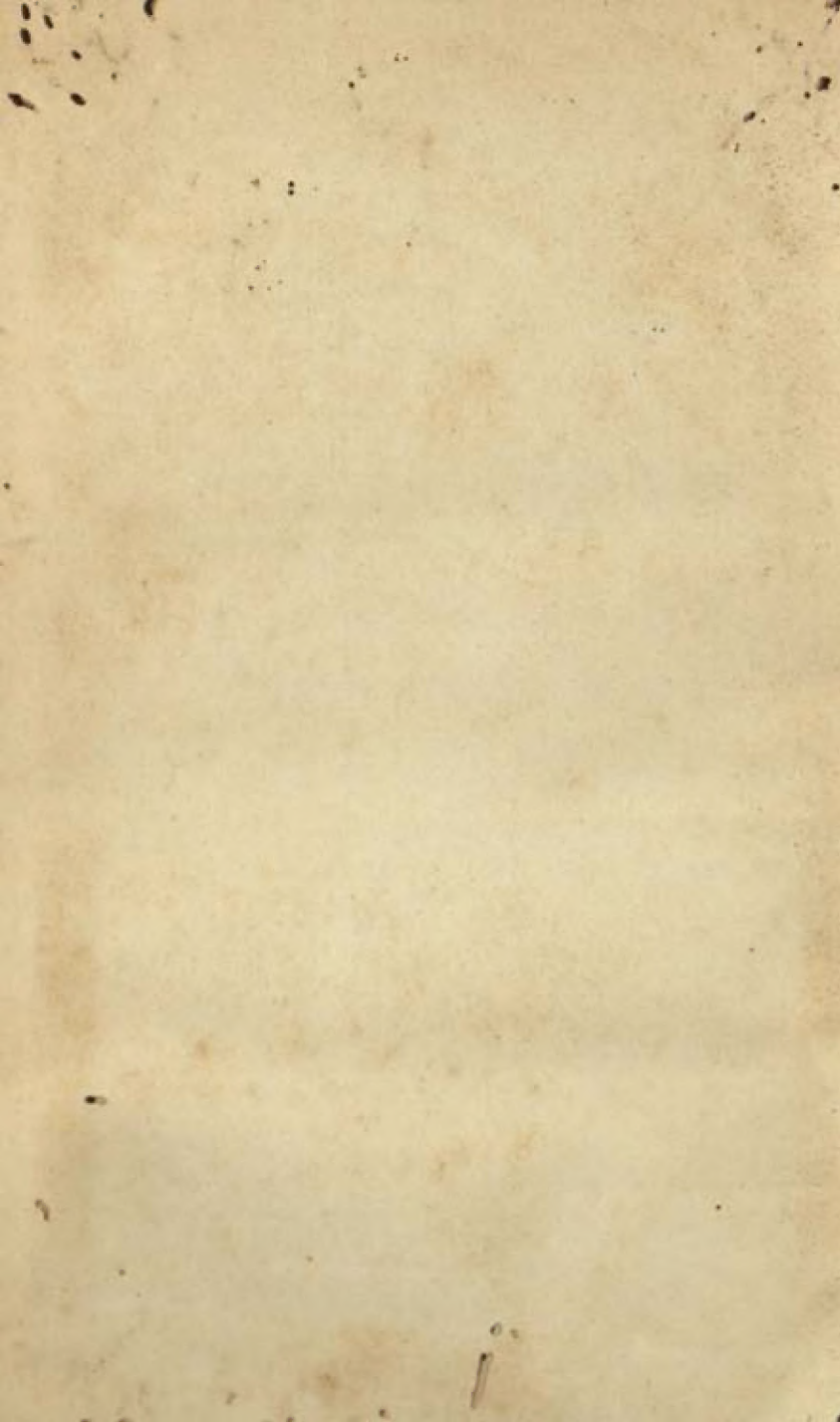
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